

**WIRELESS CONSUMERS ALLIANCE INC.**

May 5, 1999

Karen Gulick  
Legal Advisor to Commissioner Tristani  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Room 8B201  
Washington, DC 20554

**RECEIVED****MAY 6 1999****FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY**

RE: Exparte Communications  
CC Docket No.: 94-102

Dear Ms. Gulick:

Attached are copies of our current handouts. As we have previously discussed, the cellular handset is designed, pursuant to Commission rules, to scan both the A side and the B side as if they were a single system. The rules say that carriers may limit this scanning to one side only, and that is what they do by the insertion of an artificial barrier in the scanning process. Our proposed rule changes would simply remove this barrier when 911 is dialed so that the phone can scan both sides. As David Carey's engineering study shows, this can be accomplished with a few lines of code at a trivial expense.

The FCC staff recommendation of a generic rule, which permits automatic A over B or Double Push is not a good idea. The handset does not know if a connection can take place, or if a connection is made, or if a connection is over a good channel of communication. The handset should instead, as we have proposed, select the best available channel. Even if you insert a threshold as the criteria, simply switching to the other side is not the answer. For example, assume that you use the -80dBm threshold, the preferred side is -85dBm (usable but not good), and the other side is -105dBm (lock-in). (See attached drawing). If you simply switch sides, you have gone from usable to unusable signals.

Finally, as you know from the report of the Blomme situation, just having the 911 call connected should not be the criteria. When her accident occurred and 911 was called on the B side, the call was connected - - to a PSAP 40 miles away. This resulted in the dispatch of emergency equipment from the PSAP location, which took over an hour to arrive. If the call had instead gone to the A side, the nearest cell site, emergency equipment would have been dispatched from 5.3 miles away and the tragic result of the accident would have been avoided.

No. of Copies rec'd 0  
List A B C D E

Any "generic" rule should simply say that when 911 is dialed, the handset will automatically select the best channel available in the shortest time possible (not longer than 12 seconds). Obviously, Automatic A/B Roaming and Double Push do not meet this criteria. While alternative solutions may well appear, time is of the essence and we urge the Commission not to delay the effective date of the rule beyond 6 months while other solutions are thought out.

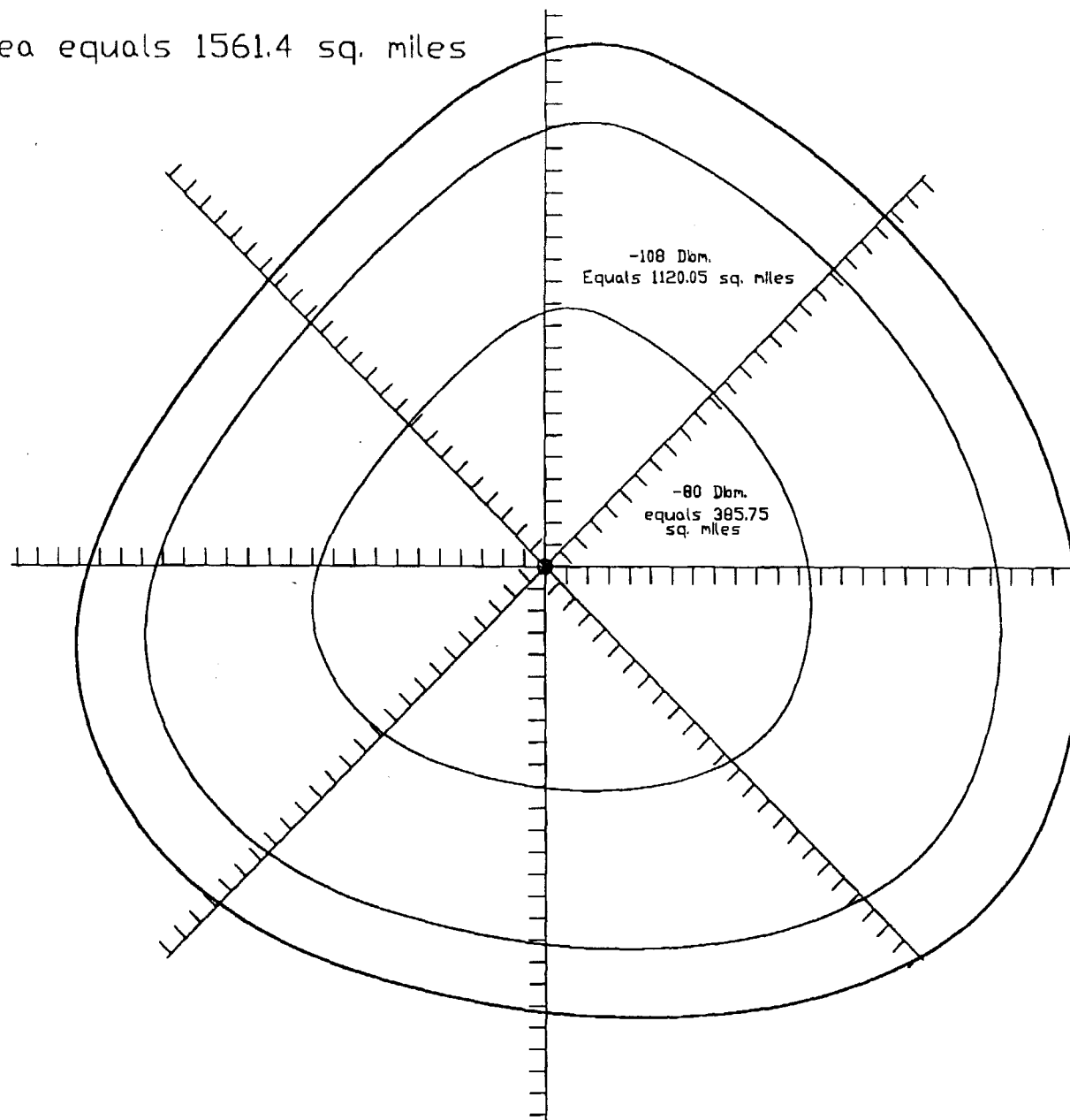
Sincerely,

A handwritten signature in cursive script that reads "Carl Hilliard".

Carl Hilliard

cc: Magalie Roman Salas

Total cell area equals 1561.4 sq. miles



AIRPORT-BLVD

# Wireless Consumers Alliance

## Strongest Signal Proposal

The Alliance requests that the FCC order the remove of the artificial barrier, inserted by wireless carriers, that prevents handsets from performing a normal scan of all channels to select the best channel available when 9-1-1 is dialed.

The following information summarizes the statements and issues before the Commission.

# Wireless phones are not reliable in all emergency situations. The public is at risk.

- Safety & security is the number one reason for owning a wireless phone.
- Consumers rely on misleading and false advertising by the wireless industry. Complete coverage is just not possible.
- The industry wants to make wireless phones the primary form of personal telecommunication: "Just like your wireline phone."
- Tragedies from unconnected 9-1-1 calls are here and on the rise.

**The Commission has a clear responsibility to ensure public safety.  
There should be NO compromise when public safety is at stake.**

The Carriers control the equipment market with no interest in promoting better connections to 9-1-1.

- Carriers have blocked the deployment of strongest signal (Audiovox).
- There is no motivation for the industry to maximize public access to 9-1-1 services. It is a non-profit making service.
- Misleading consumer advertising is commonplace while emergency access abilities are misstated.
- **If the decision is left up to the carriers, the public will be shortchanged.**

Generic rule language (a handset must be able to seek out the other analog cellular carrier if the 9-1-1 call "does not go through") will NOT fix the problem.

- The handset does not know if the call is connected.
  - The handset can lock-in to an inadequate signal.
  - Poor channels can be selected.
    - Static and cross talk.
    - Dropped calls.
- Time delay – cannot exceed 12 seconds.
  - A/B Roaming
    - Re-registration can take up to 18 seconds.
    - Retry can take up to 65 seconds.
  - Strongest Signal
    - 4-6 seconds.
- Motorola's Network Solution is an alternative solution but...
  - Lengthy time to develop
    - "Lives may be unnecessarily lost waiting for appropriate technological solutions."
  - Expensive
    - Extensive changes to software/hardware for the base stations.

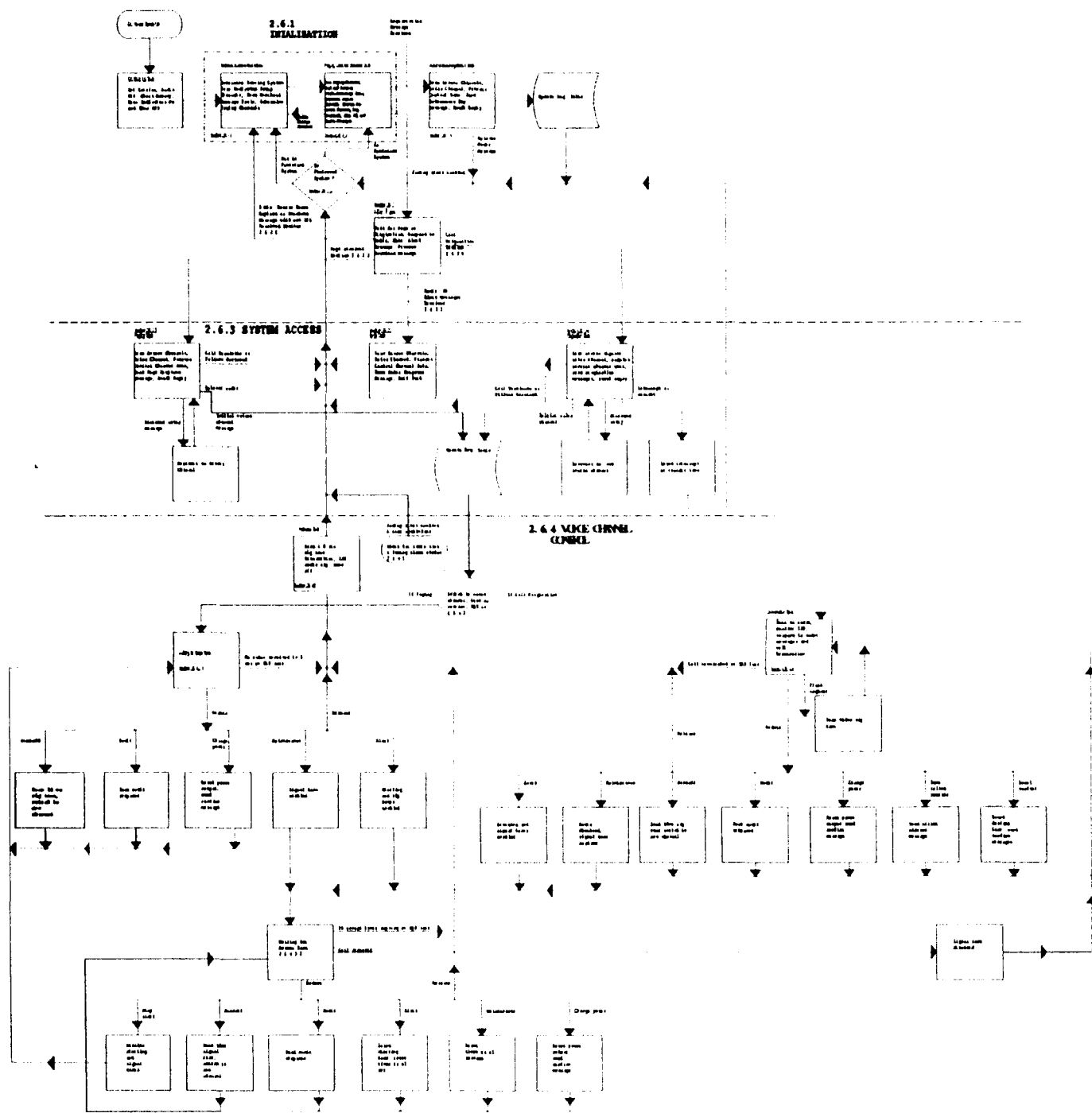
Strongest Signal (all channel scanning) gives the caller the best available channel of communication for 9-1-1 calls – simple A/B or even automatic A/B does not.

- Strongest signal can be quickly deployed at a trivial cost.
  - Automatic A/B will take 3 times longer to deploy. It is more complex and is more expensive.
- Call connect time favors strongest signal.
  - Strongest signal takes 4-6 seconds, up to 65 seconds for A/B.
- Automatic A/B has serious flaws
  - Lock-in limits the effectiveness of automatic A/B.
  - CTIA uses cover-up terms such as the call was “completed,” “successfully sent” or the handset is in a “conversation state” to imply that the call has been connected. This is not true.
  - Automatic A/B can lead to poor quality channels with static, cross-talk and dropped calls.
- The so-called “objections” to strongest signal are without basis in fact.
  - False and misleading statements have been made over and over again:
    - *False* - “Automatic A/B considers elements of call set up which Strongest Signal does not.”
    - *Misleading* - “Strongest Signal will not always give you the strongest voice channel”

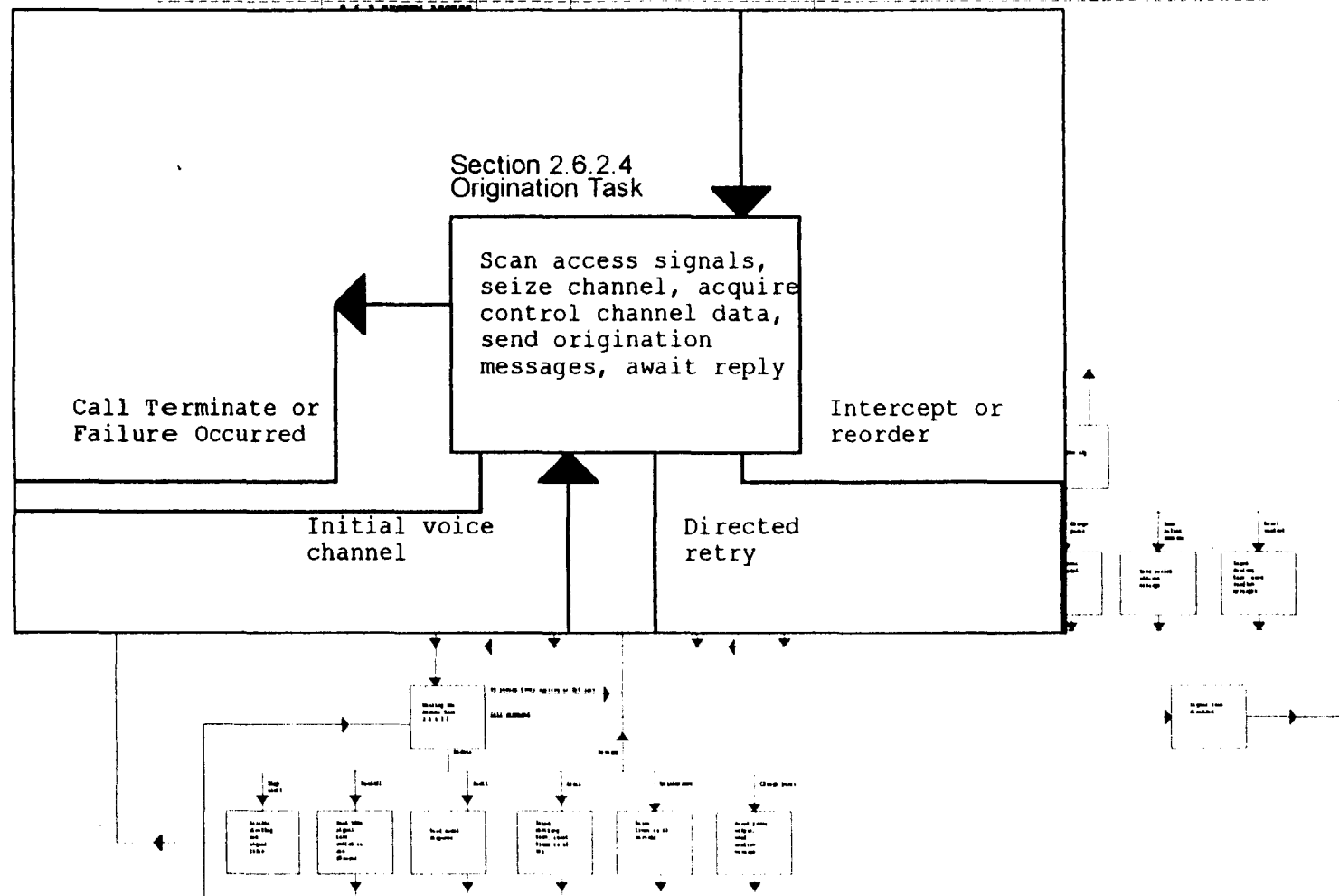
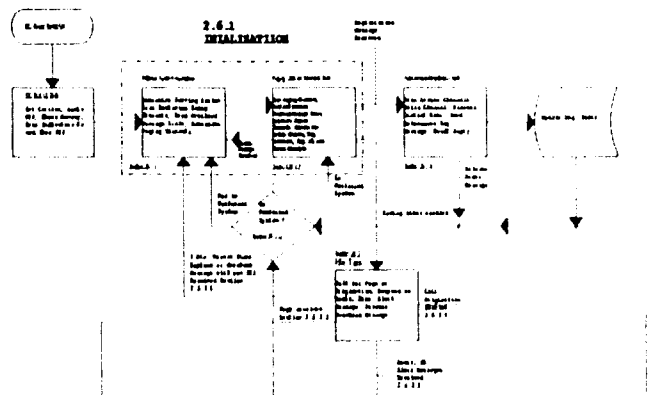


# Conclusion

- **The Commission has found that the public interest requires access to 911 over the wireless system "that will provide the quickest and most reliable and accurate response."**
- **After more than four years the only viable solution that has been proposed is strongest signal.**







# SCNDCC:

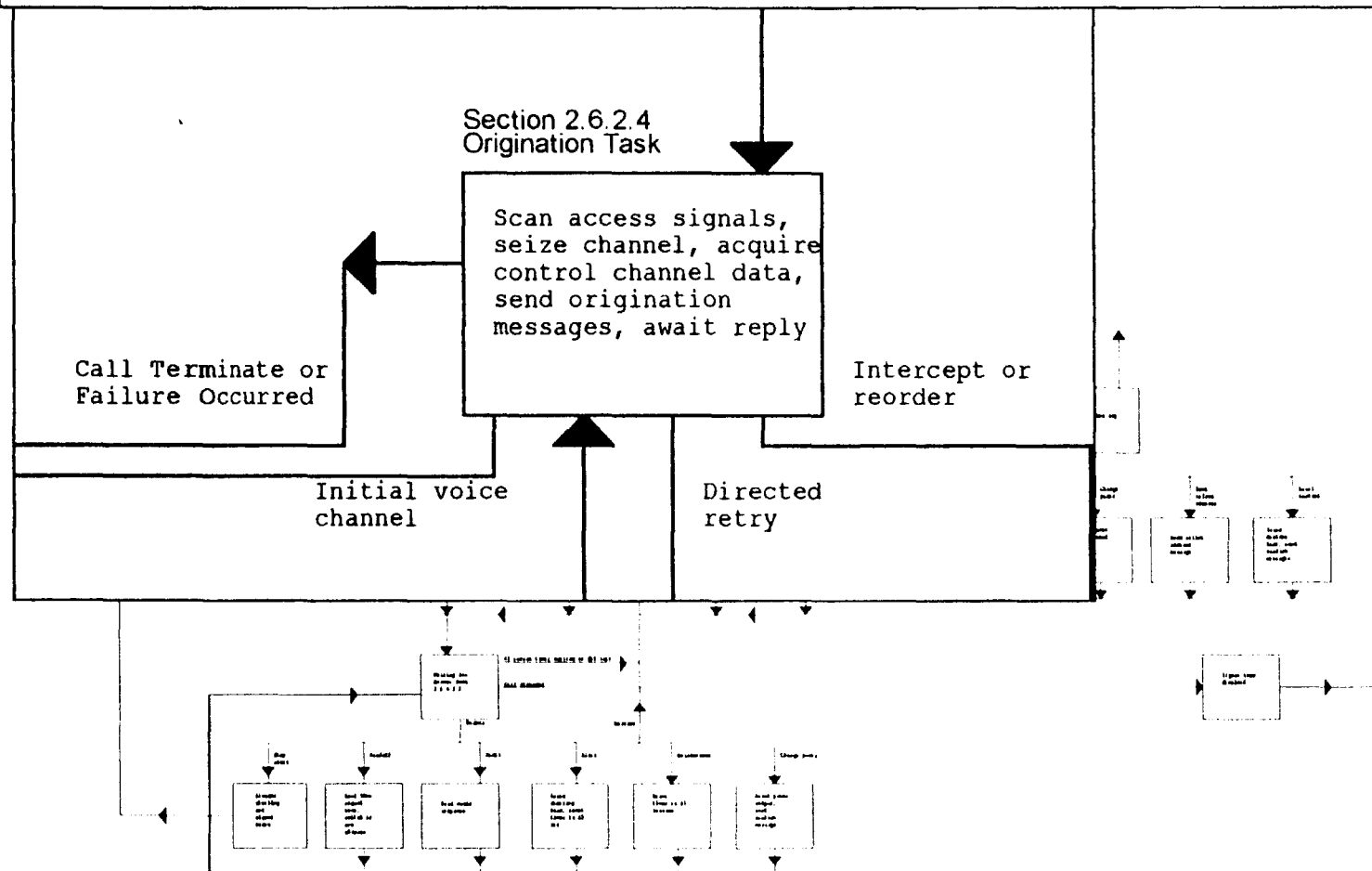
JBR EMGNCY\_B, NON911 ; IF NOT 911 CALL - JUMP

MOVW BA, #354 ; Set A and B register to Last Dedicated Control Channel of B system (354)

JBS SSS\_B, DCCHS1 ; Jump to DCCHS1 if SSS\_B is set to true (This is the A system)

MOVW BA, #313 ; Set A and B register to Last Dedicated Control Channel of A system (313)

MOV R6, #42 ; Set R6 to 42



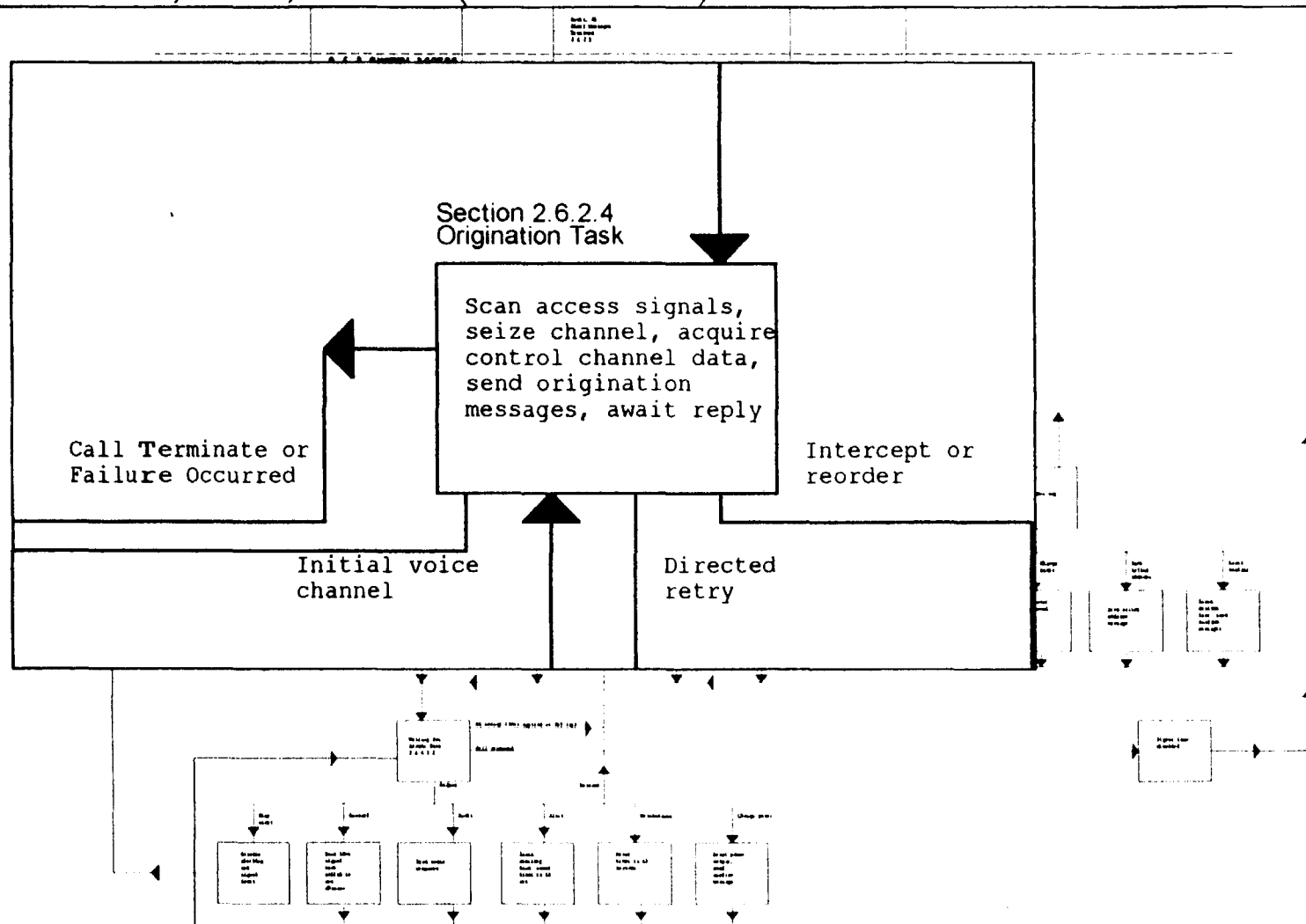
NON911:

MOVW BA,#IDCCA ; Set A and B register to First Dedicated Control Channel of A system (333)

JBS SSS\_B,DCCHS1 ; Jump to DCCHS1 if SSS\_B is set to true (This is the A system)

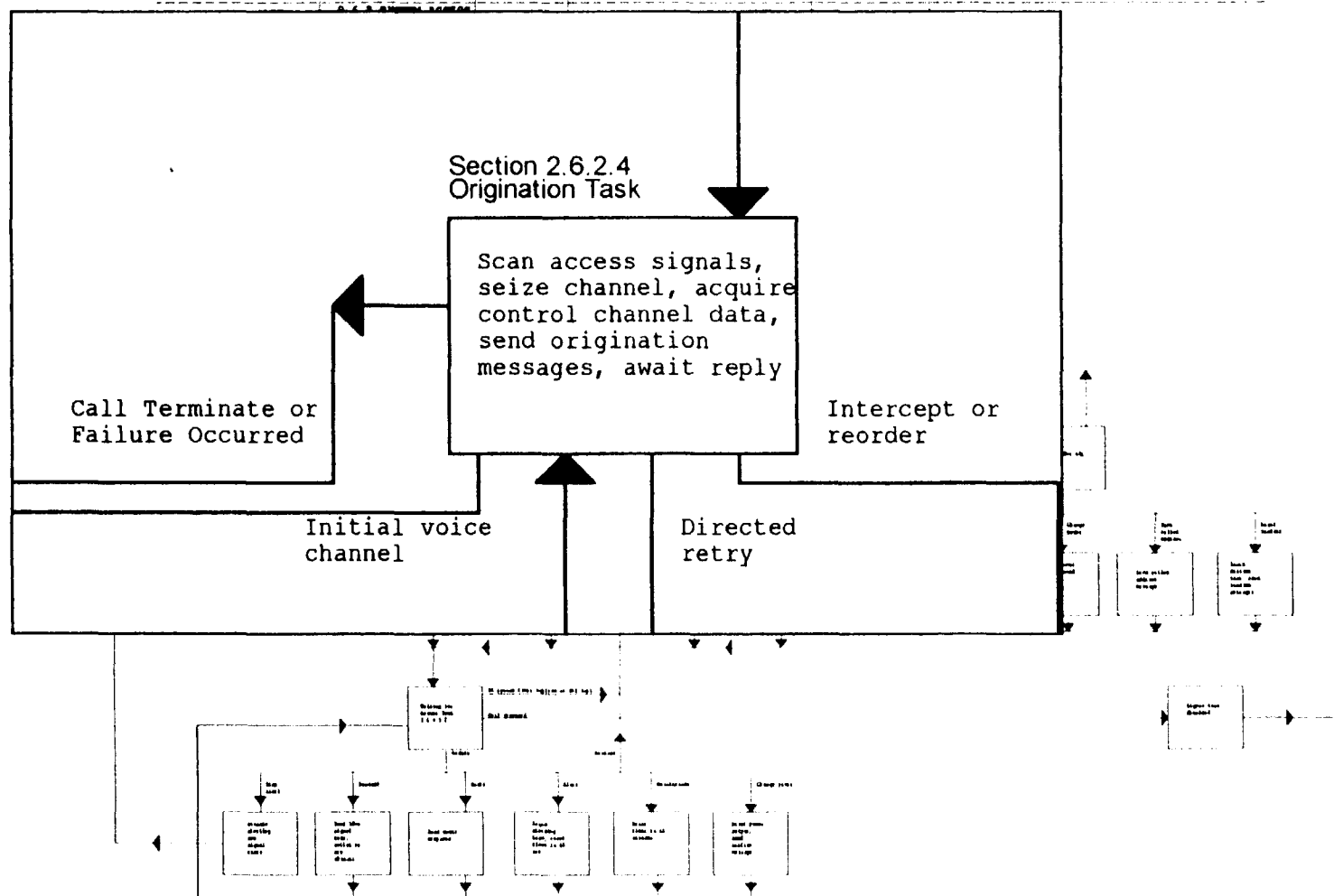
MOVW BA,#IDCCB ; Set A and B register to First Dedicated Control Channel of B system (334)

MOV R6,#NDED ; Set R6 to 21 (NDED contains 21)



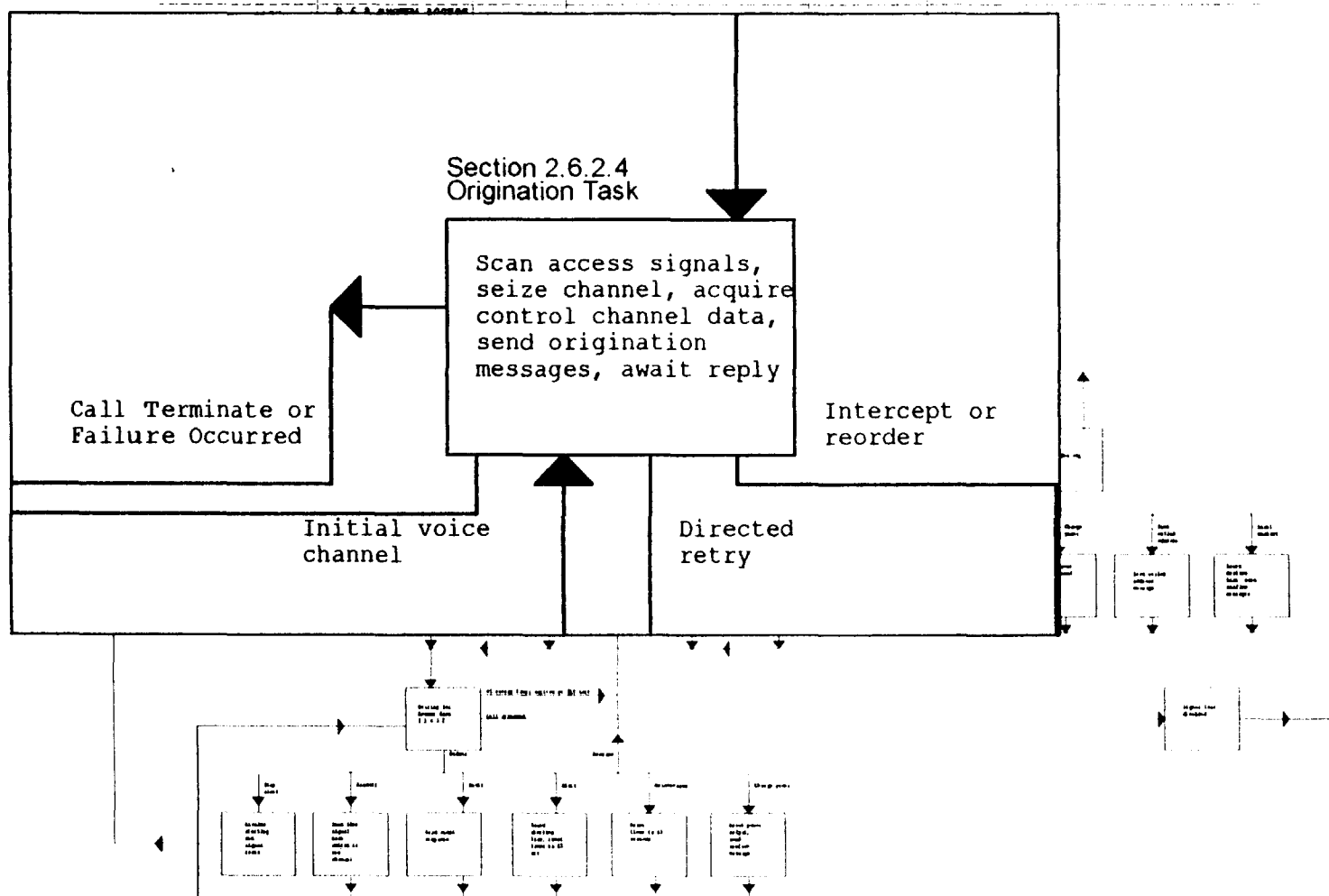
**DCCHS 1:**

ST	B,CHAN_D+1 ; Store the Channel number from above into the Channel Variable
ST	A,CHAN_D
MOV	R6,#NDED ; Set R6 to 21 (NDED contains 21)
CAL	SCNCC ; Call the Scan Control Channel Routine

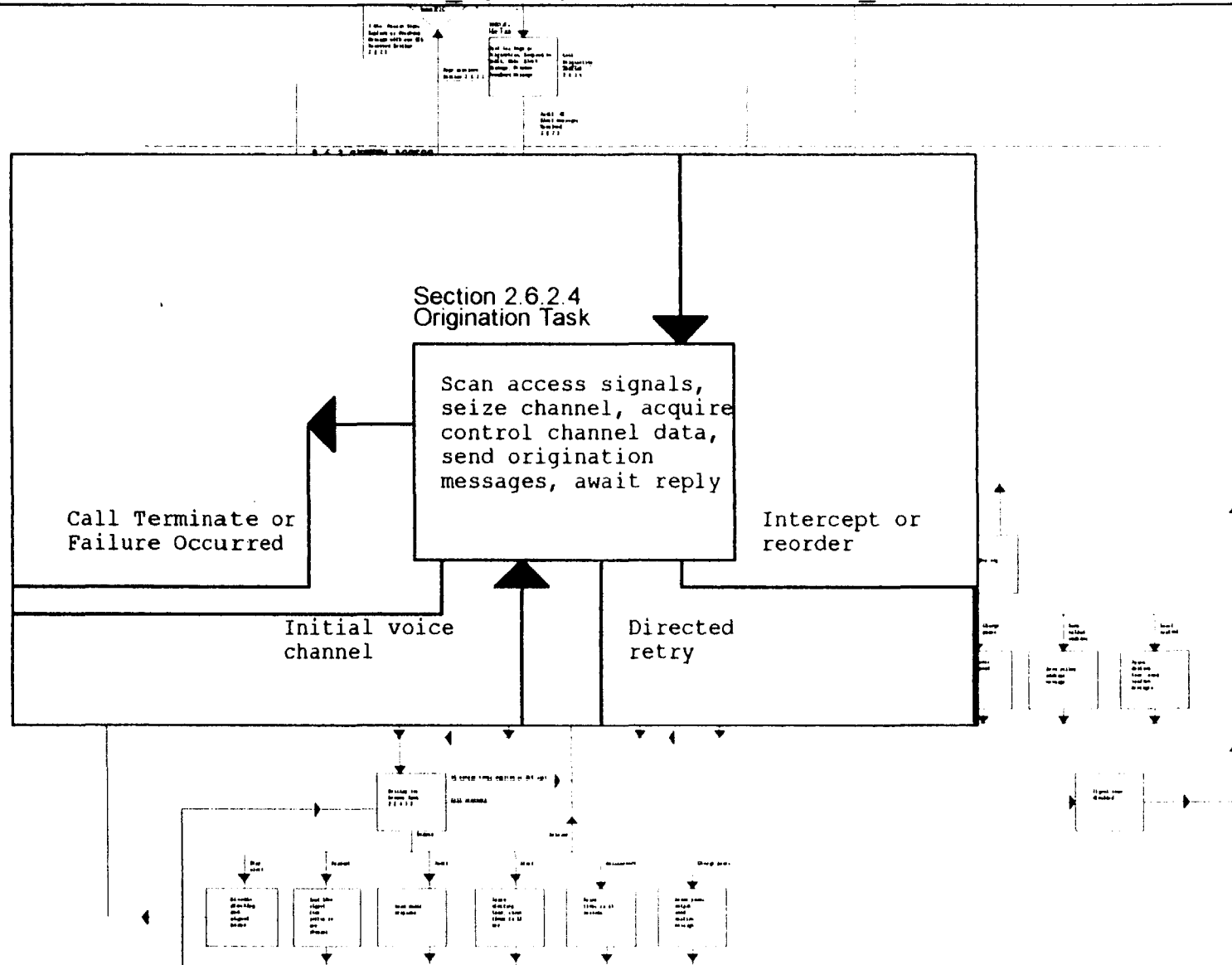
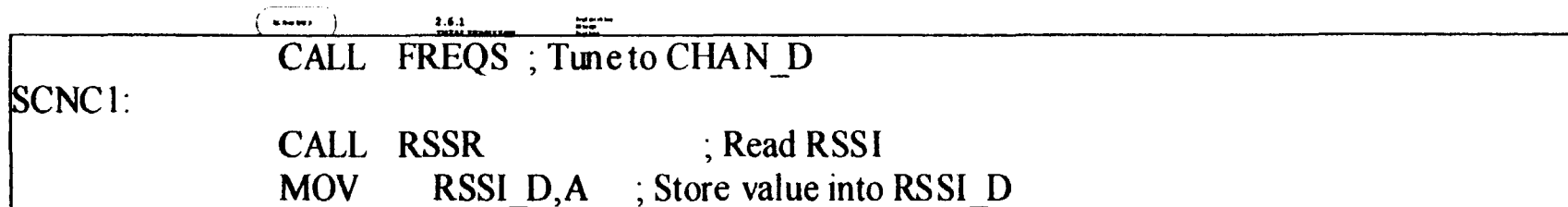


## SCN CC:

<b>CLRW</b>	<b>BA</b> ; Clear the B and A registers
<b>ST</b>	<b>A,RSSI1_D</b> ; RSSI1_D <--- 0 (This is the strongest Channel level)
<b>ST</b>	<b>A,RSSI2_D</b> ; RSSI2_D <--- 0 (This is the second strongest Channel level)
<b>MOVW</b>	<b>CHWK1_D,BA</b> ; CHWK1_D <-- 0 (This is the strongest Channel number)
<b>MOVW</b>	<b>CHWK2_D,BA</b> ; CHWK2_D <-- 0 (This is the second strongest Channel number)
<b>MOV</b>	<b>NLIST D,R6</b> ; Move the number of Control Channels to scan into NLIST_D (21 or 42)







# Strongest Signal

Scan all 42 control channels

Section 2.6.3.2

Lock on strongest channel

Seize Reverse Control Channel

Connect to the PSAP

# Software Modifications

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Strongest Signal

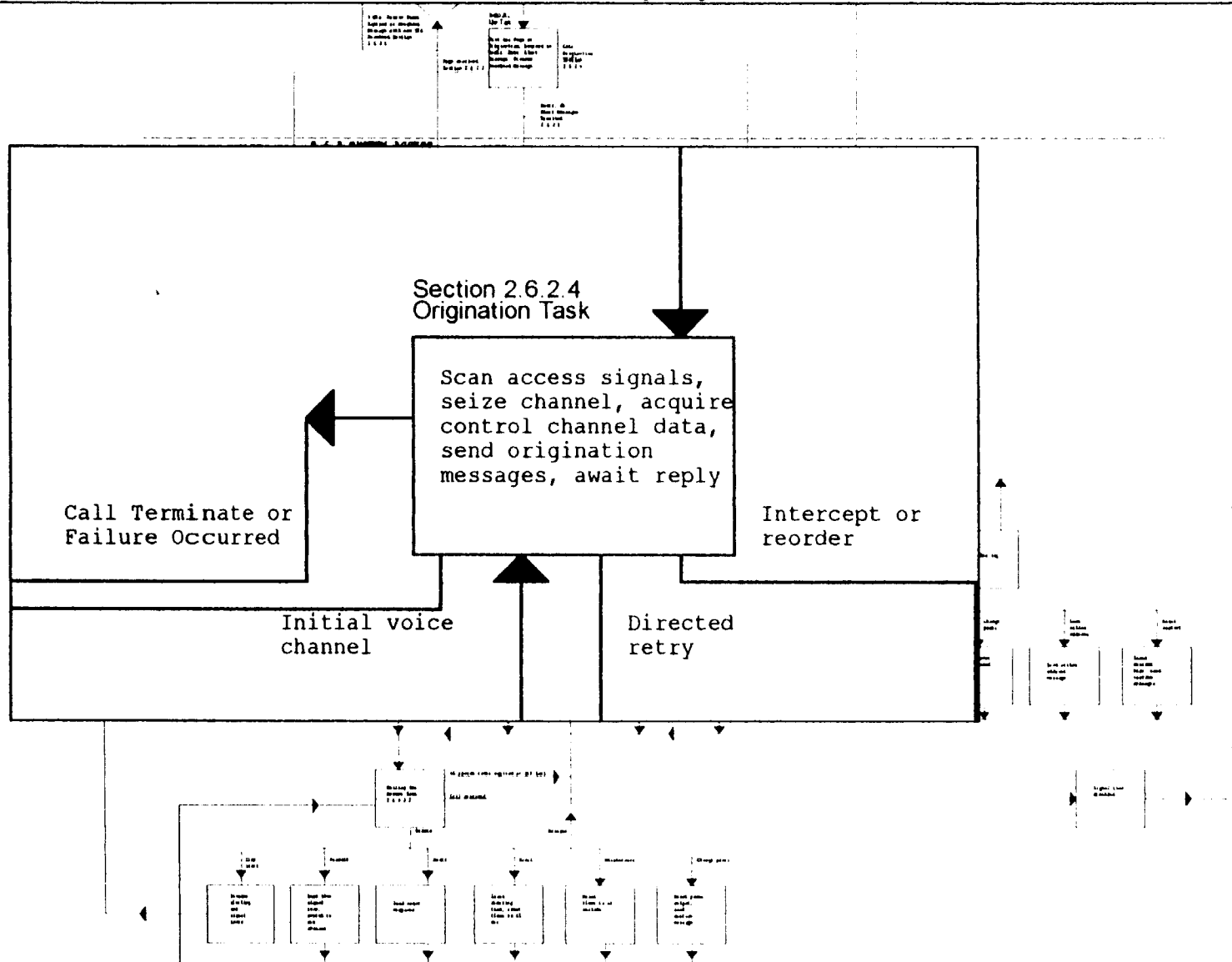
Strongest/Adequate Signal

; Compare new RSSI value to Largest RSSI value so far.

MOV A,RSSI1\_D ; Load RSSI1\_D into A register

CJNE A,RSSI\_D,\$+3 ; if RSSI1\_D < RSSI\_D

JNC SCNC5 ; jump if false



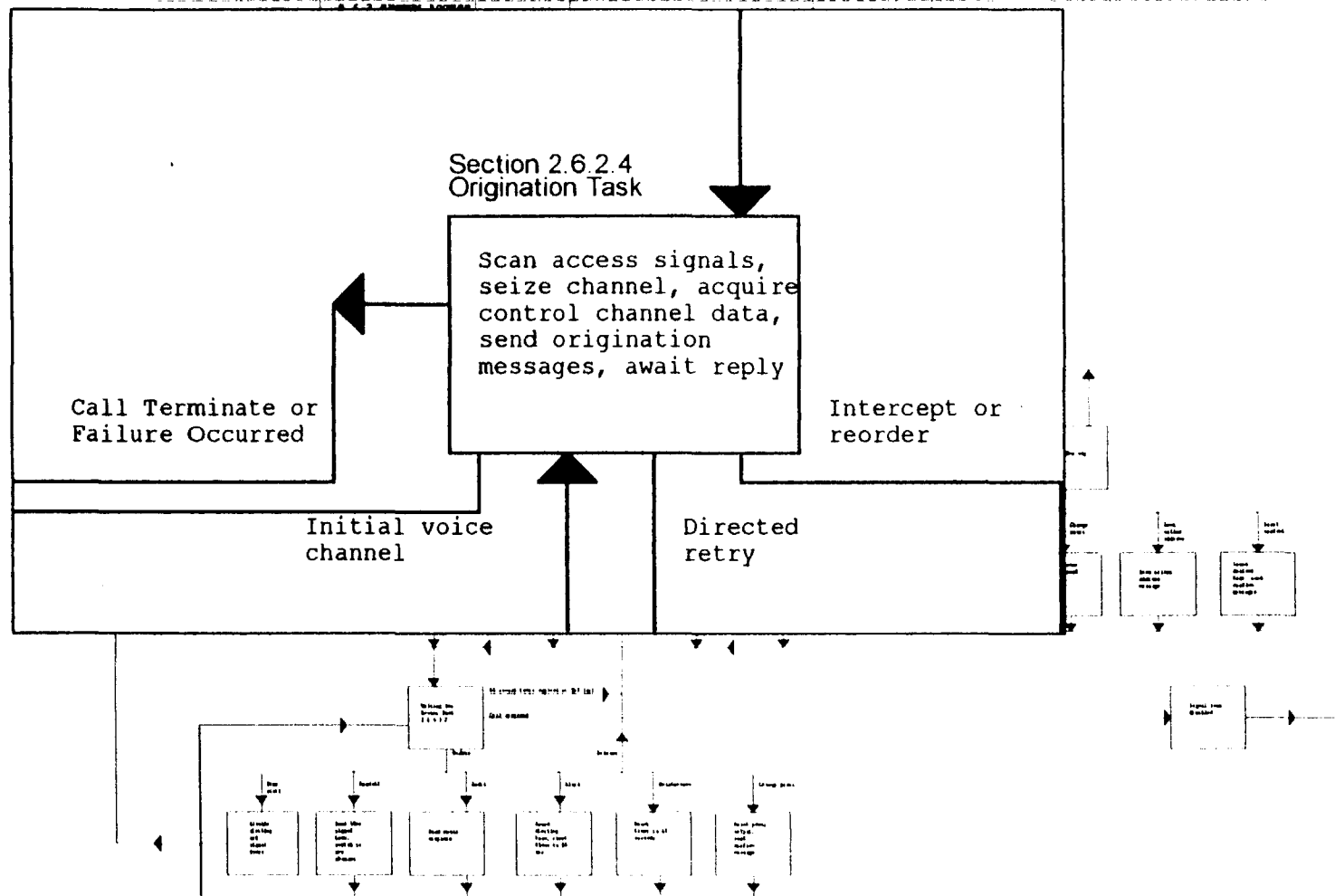
2.6.1 INITIAL REACTION

```
MOV     RSSI1_D,RSSI_D  ; RSSI1_D <--- RSSI_D
```

MOVW BA,CHWK1\_D

MOVW BA,CHAN D

		1427	
<b>A-2-B BUREAU LOGS</b>			

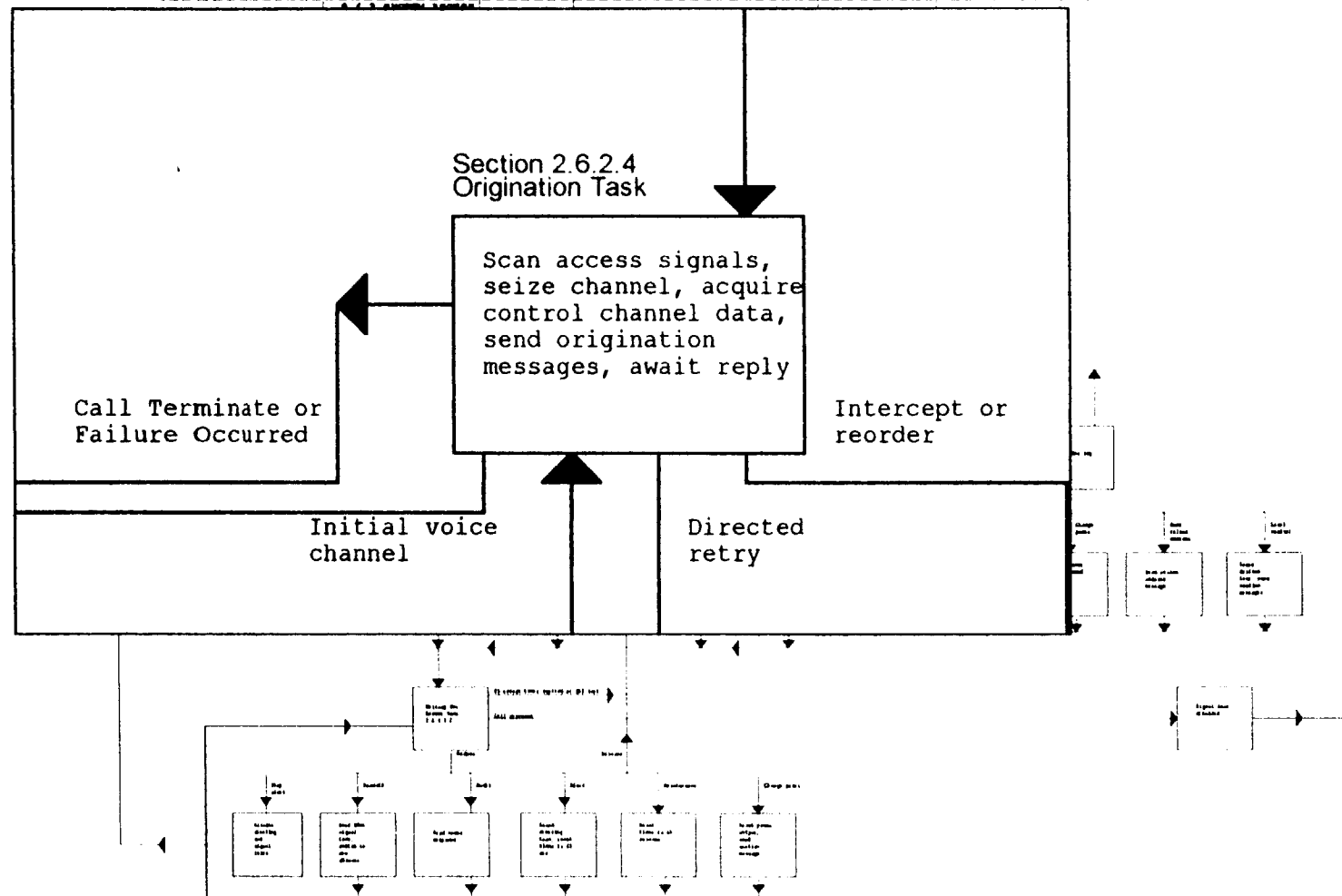


SCNC5:

```

MOV  A,RSSI2_D;(CSA) TO MAKE CJNE VALID
CJNE A,RSSI_D,$+3 ; if RSSI2_D < RSSI_D
JNC  SCNC6 ; jump if false
MOV  RSSI2_D,RSSI_D ; RSSI2_D <--- RSSI_D
MOVW BA,CHAN_D
MOVW CHWK2_D,BA ; CHWK2_D <--- CHAN_D

```



2.6.1

2.6.1

2.6.1

```
MOV A,NLIST_D ; Load A register with Number of Control Channels
DEC A          ; Decrement A
ST A,NLIST_D   ; Store A into Number of Control Channels
JZ SCNC7       ; If A = 0 then Jump to SCNC7 (Done with loop)
CALL CNTUPCH   ; COUNT UP CHANNEL
```

```
CALL FREQS ; Tune to new channel
JMP SCNC1 ; Go back to the top
```

#### Section 2.6.2.4 Origination Task

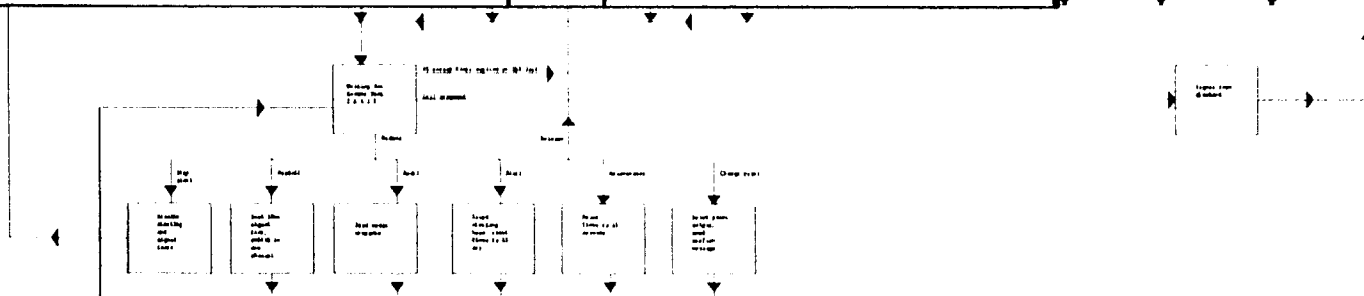
Scan access signals,  
seize channel, acquire  
control channel data,  
send origination  
messages, await reply

Call Terminate or  
Failure Occurred

Intercept or  
reorder

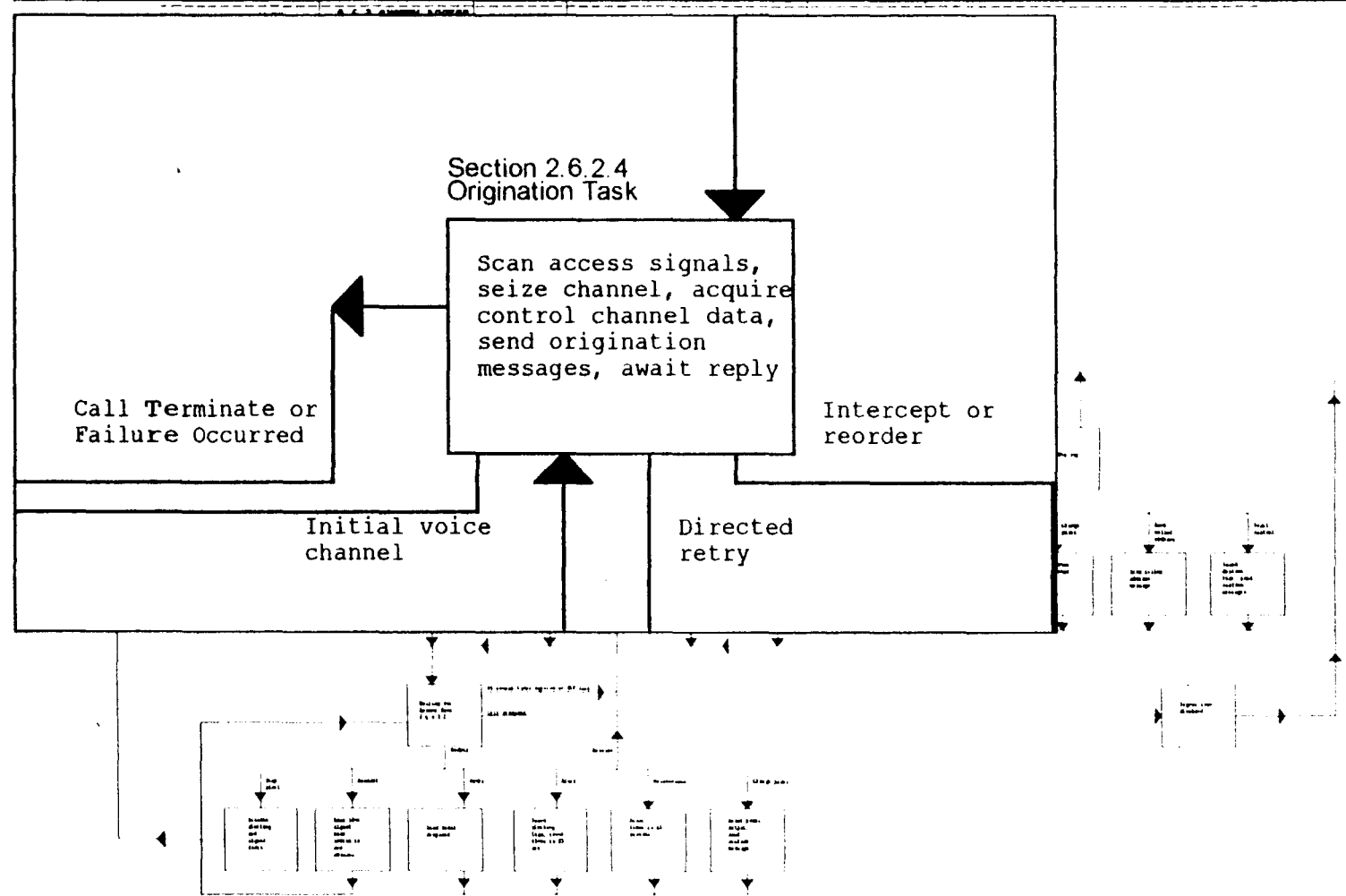
Initial voice  
channel

Directed  
retry

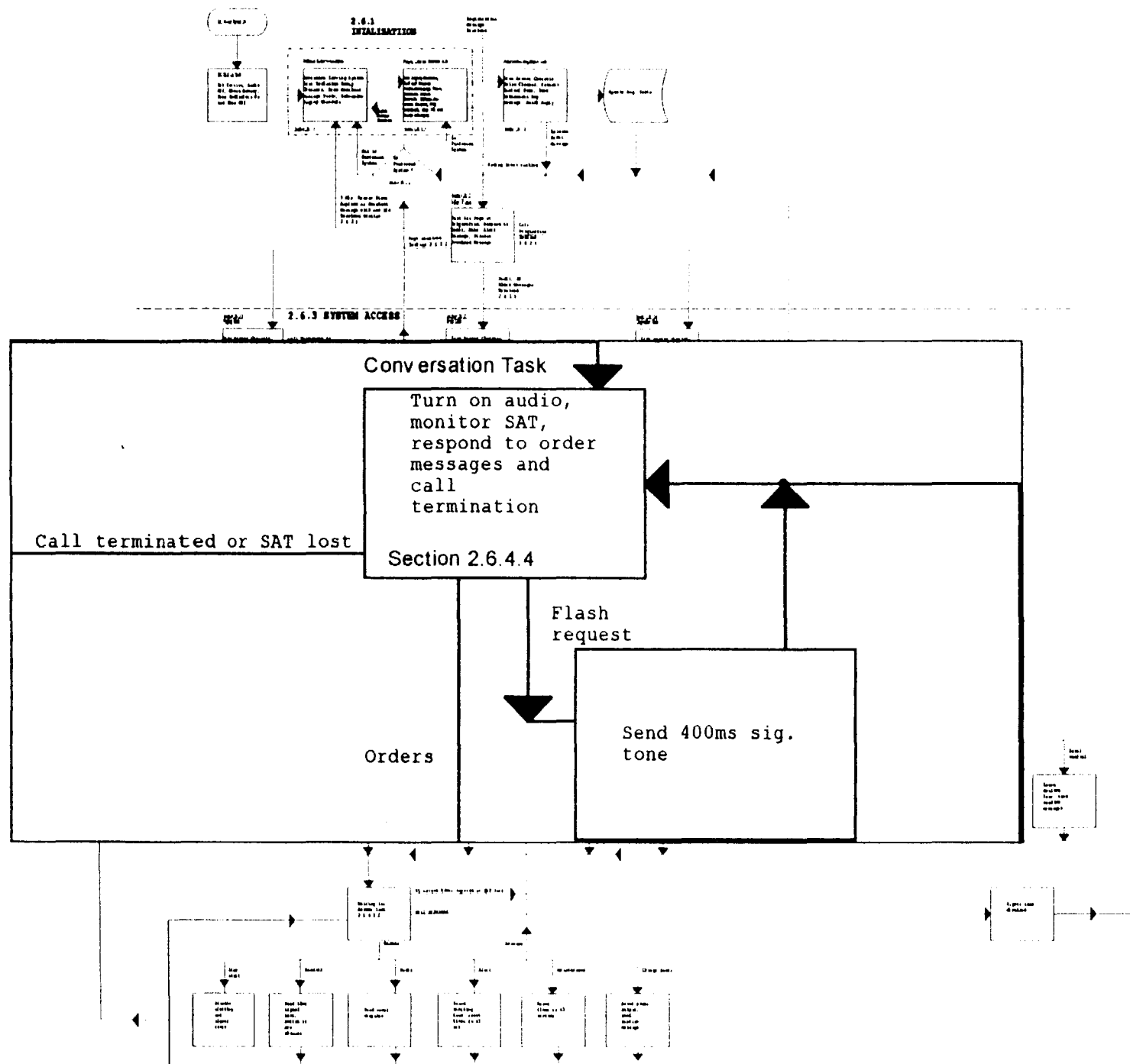


CHWK1\_D is moved to CHAN\_D and the channel is tuned.

```
MOV CHAN_D,CHWK1_D
MOV CHAN_D+1,CHWK1_D+1
MOV RSSI_D,RSSI_D
JMP TUNEC ; Jump to tune channel routine
```







# Strongest/Adequate Signal

Scan all 21 control channels for Preferred System

Section 2.6.3.2

Compare strongest channel to preset Limit (-80 dBm)

If RSSI is greater than or equal to Limit

Tune to Channel

Seize Reverse Control Channel

Connect to PSAP

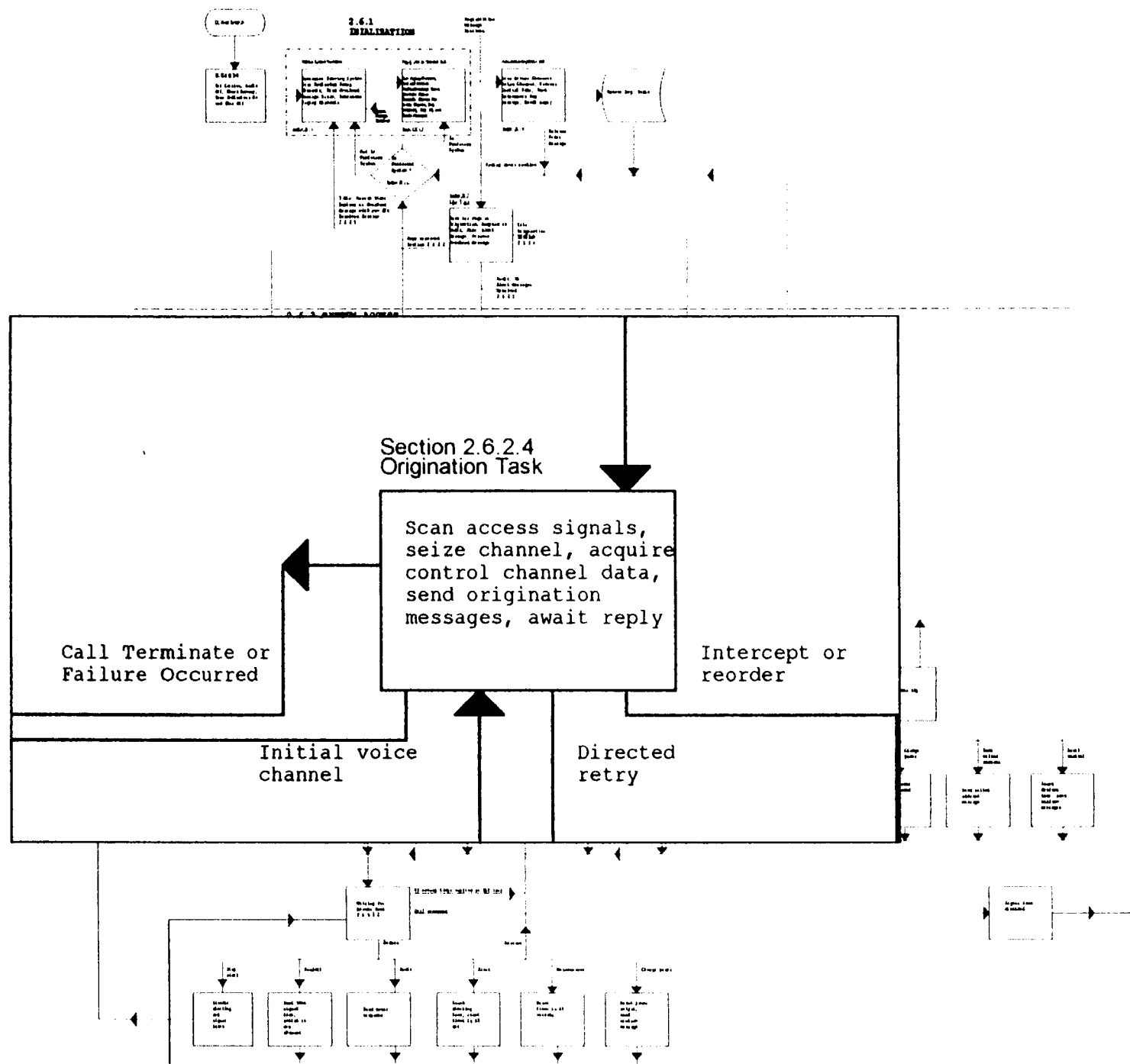
If RSSI is less than the Limit

Scan remaining control channels

tune to strongest channel across 42 control channels

Seize Reverse Control Channel

Connect to the PSAP

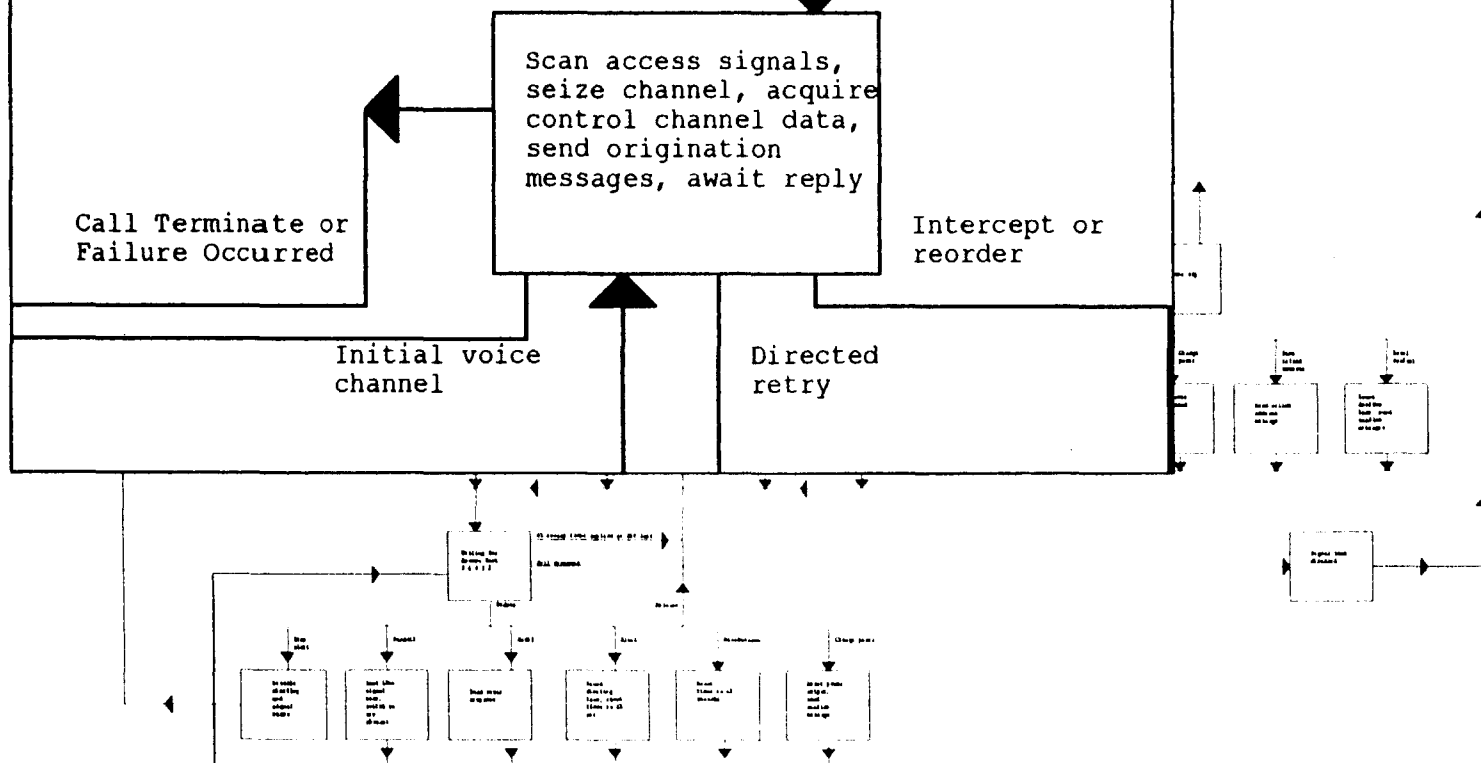


```

; SCAN DEDICATED CONTROL CHANNEL;
SETB  FIRSTPASS ; This will indicate if this is the first time through this code
SCNDCC:

JBR   FIRSTPASS, SCNDCC2 ; IF NOT FIRSTPASS CALL JUMP
MOVW  BA,#IDCCA ; Set A and B register to First Dedicated Control Channel of A system (333)
JBS   SSS_B,DCCHS1 ; Jump to DCCHS1 if SSS_B is set to true (This is the A system)
MOVW  BA,#IDCCB ; Set A and B register to First Dedicated Control Channel of B system (334)
JMP   DCCHS1
    
```

### Section 2.6.2.4 Origination Task

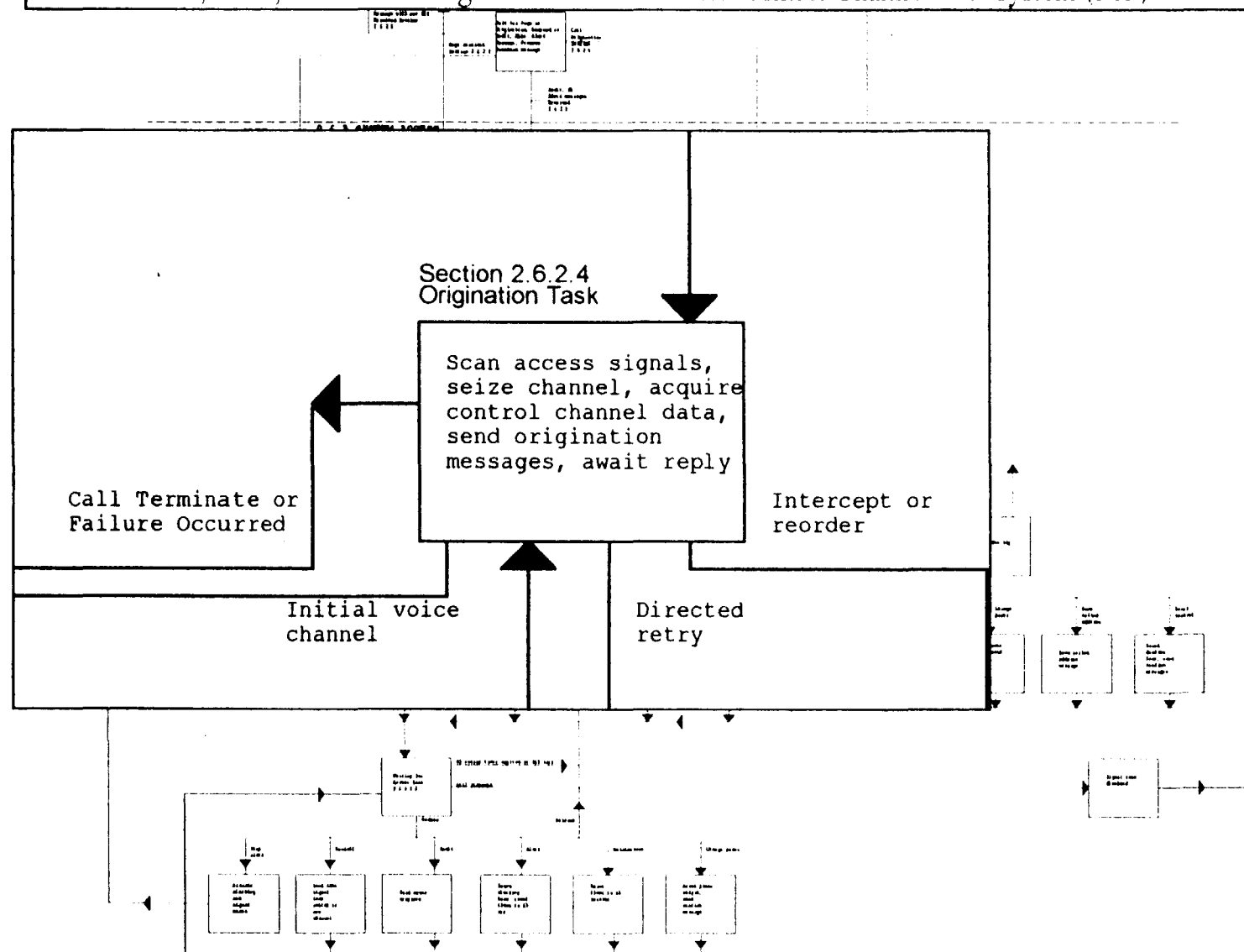


SCNDCC2:

MOVW	BA,#354 ; Set A and B register to Last Dedicated Control Channel of B system (354)
------	--

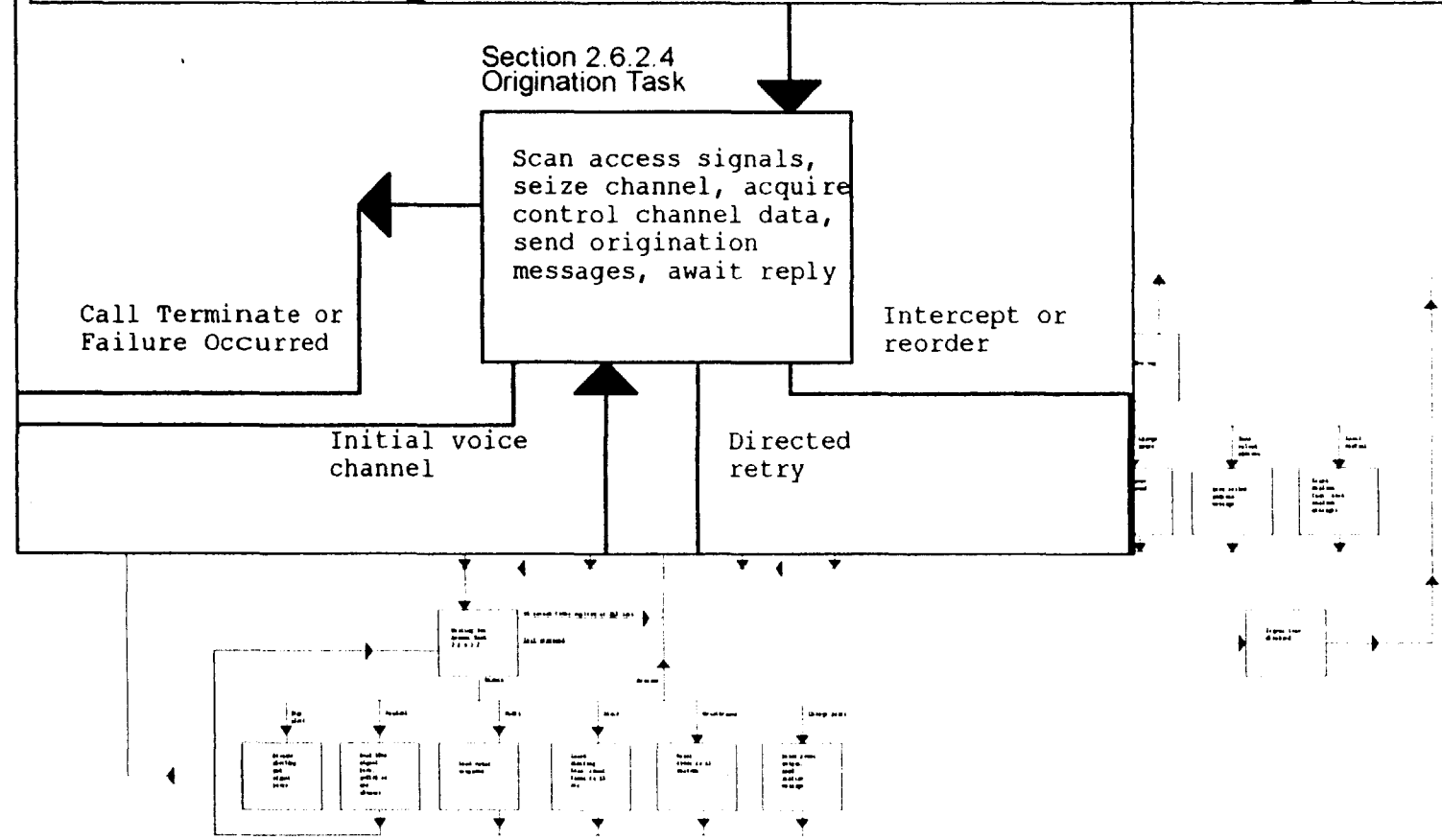
JBS SSS B,DCCHS1 ; Jump to DCCHS1 if SSS B is set to true (This is the A system)

MOVW	BA,#313 ; Set A and B register to Last Dedicated Control Channel of A system (313)
------	--



```

SCAN CONTROL CHANNEL;
SCNCC:
; This will force the code to clear the scan list on the first pass only.
JBR    FIRSTPASS, SECONDPASS      ; IF NOT FIRSTPASS CALL - JUMP
CLRW   BA ; Clear the B and A registers
ST     A,RSSI1_D      ; RSSI1_D <--- 0 (This is the strongest Channel level)
ST     A,RSSI2_D      ; RSSI2_D <--- 0 (This is the second strongest Channel level)
MOVW   CHWK1_D,BA     ; CHWK1_D <--- 0 (This is the strongest Channel number)
MOVW   CHWK2_D,BA     ; CHWK2_D <--- 0 (This is the second strongest Channel number)
MOV     NLIST_D,R6 ; Move the number of Control Channels to scan into NLIST_D (21 or 42)
    
```

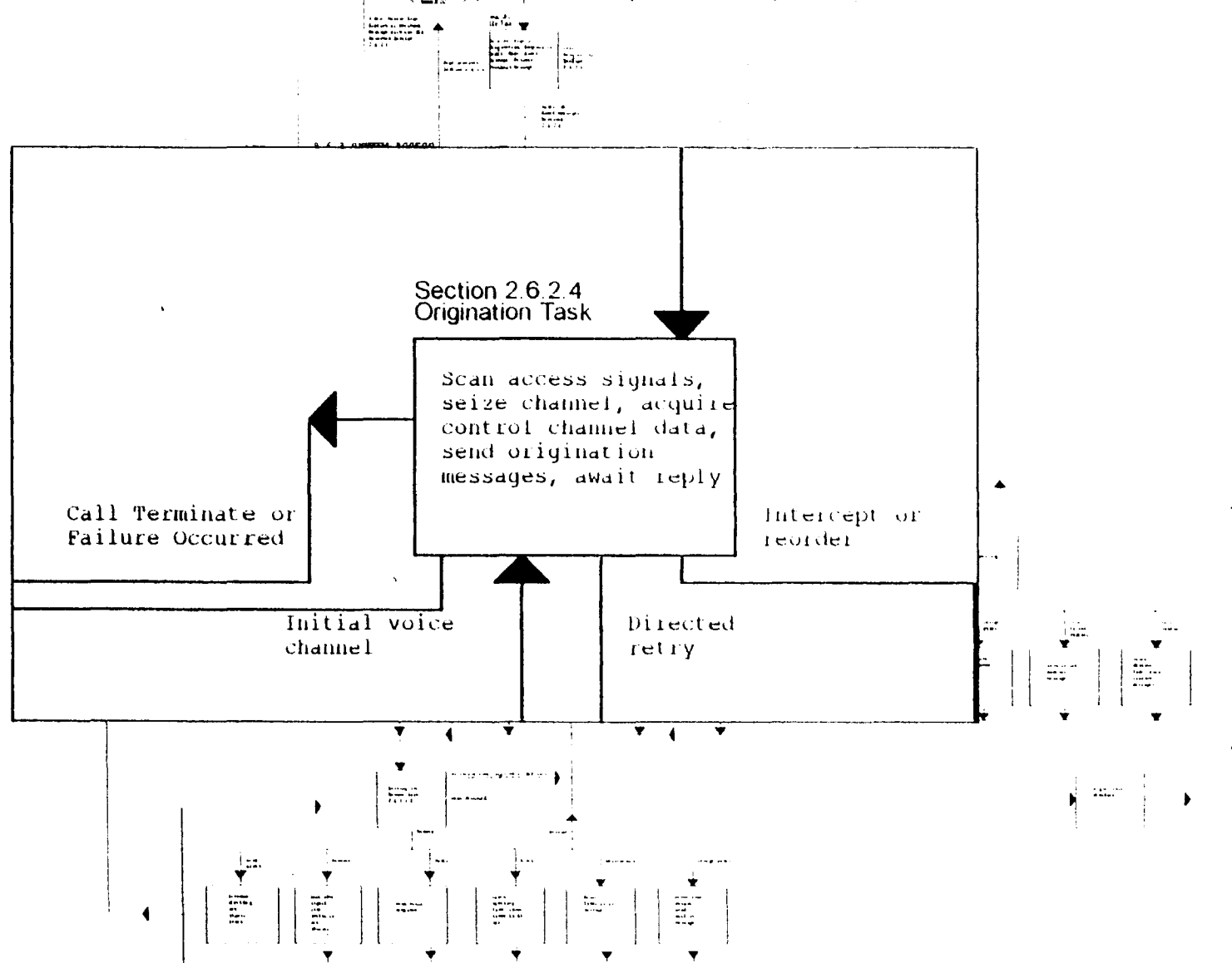


CALL FREQS ; Tune to CHAN\_D

SCNC1:

CALL RSSR ; Read RSSI

MOV RSSI\_D,A ; Store value into RSSI\_D

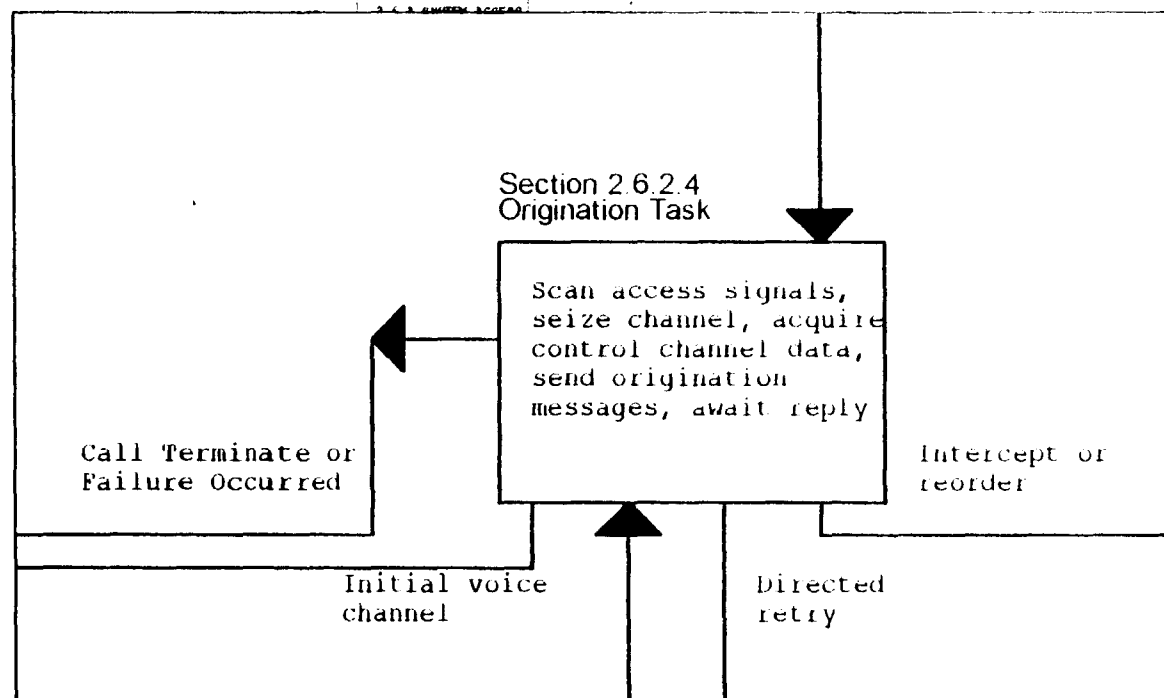


; Compare new RSSI value to Largest RSSI value so far.

MOV A,RSSI1\_D ; Load RSSI1\_D into A register

CJNE A,RSSI\_D,\$+3 ; if RSSI1\_D < RSSI\_D

JNC SCNC5 ; jump if false





2.6.1  
2.6.1  
2.6.1  
; Move RSSI1 to RSSI2 and new value into RSSI1

MOV RSSI2\_D,RSSI1\_D ; RSSI2\_D <--- RSSI1\_D

MOV RSSI1\_D,RSSI\_D ; RSSI1\_D <--- RSSI\_D

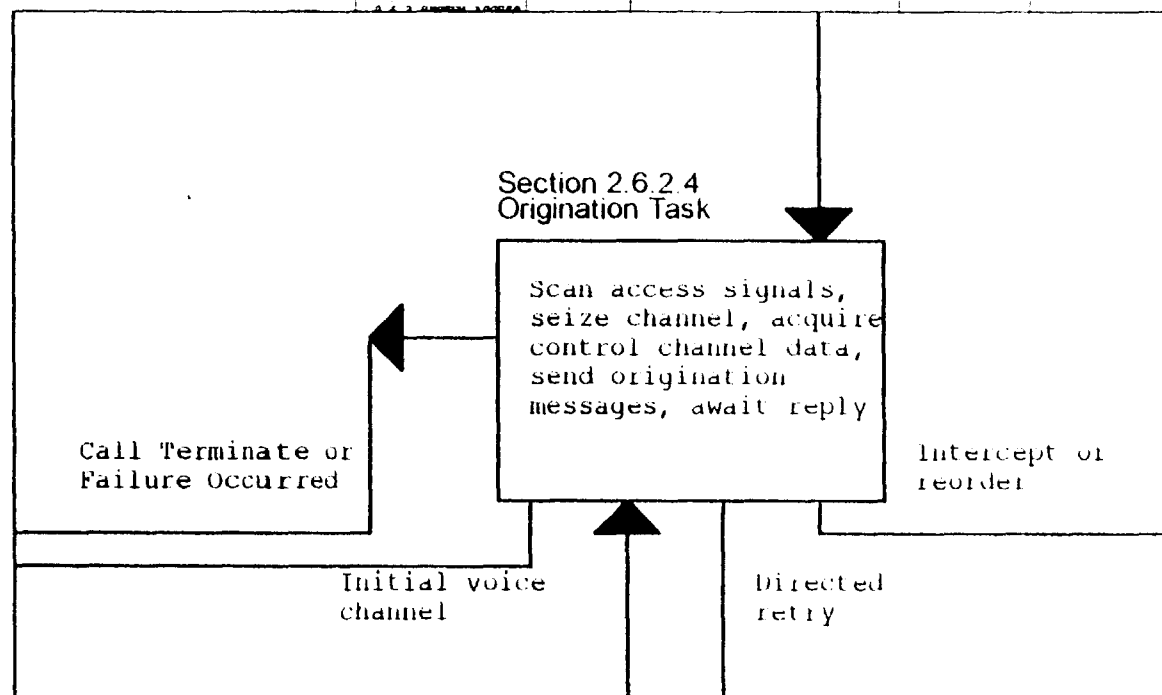
; Shift Channel numbers down to correspond to RSSI values

MOVW BA,CHWK1\_D

MOVW CHWK2\_D,BA ; CHWK2\_D <--- CHWK1\_D

MOVW BA,CHAN\_D

MOVW CHWK1\_D,BA ; CHWK1\_D <--- CHAN\_D

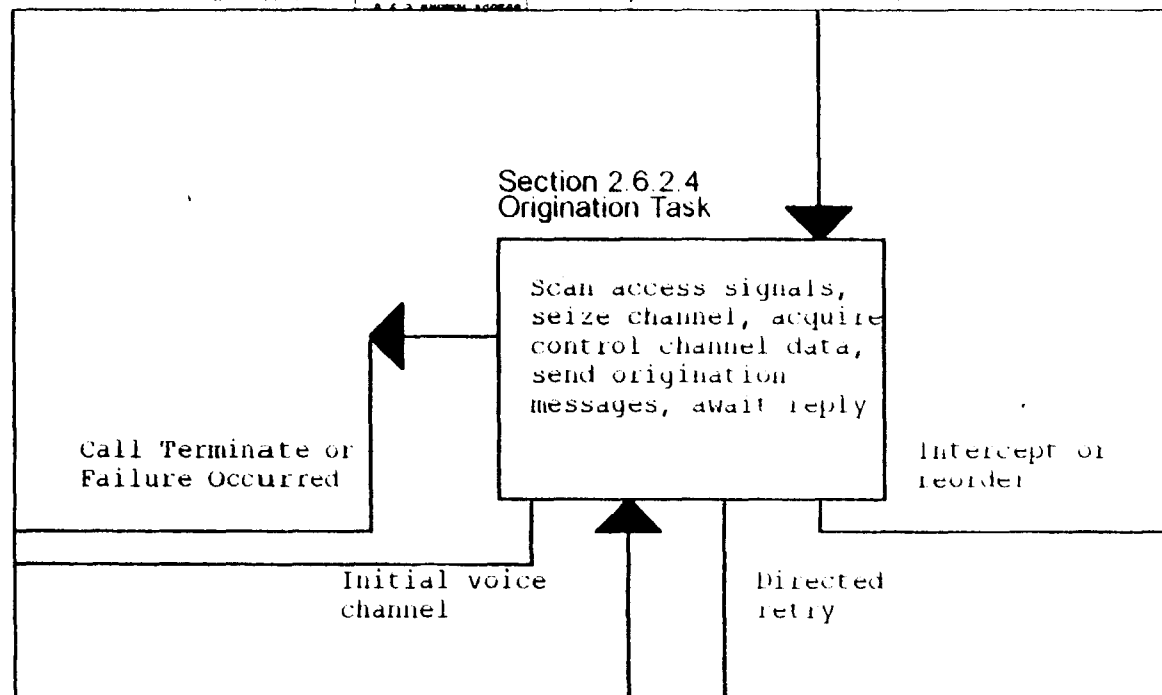


SCNC5:

```

MOV  A,RSSI2_D;(CSA) TO MAKE CJNE VALID
CJNE A,RSSI_D,$+3 ; if RSSI2_D < RSSI_D
JNC  SCNC6 ; jump if false
MOV  RSSI2_D,RSSI_D ; RSSI2_D <--- RSSI_D
MOVW BA,CHAN_D
MOVW CHWK2_D,BA ; CHWK2_D <--- CHAN_D

```



```

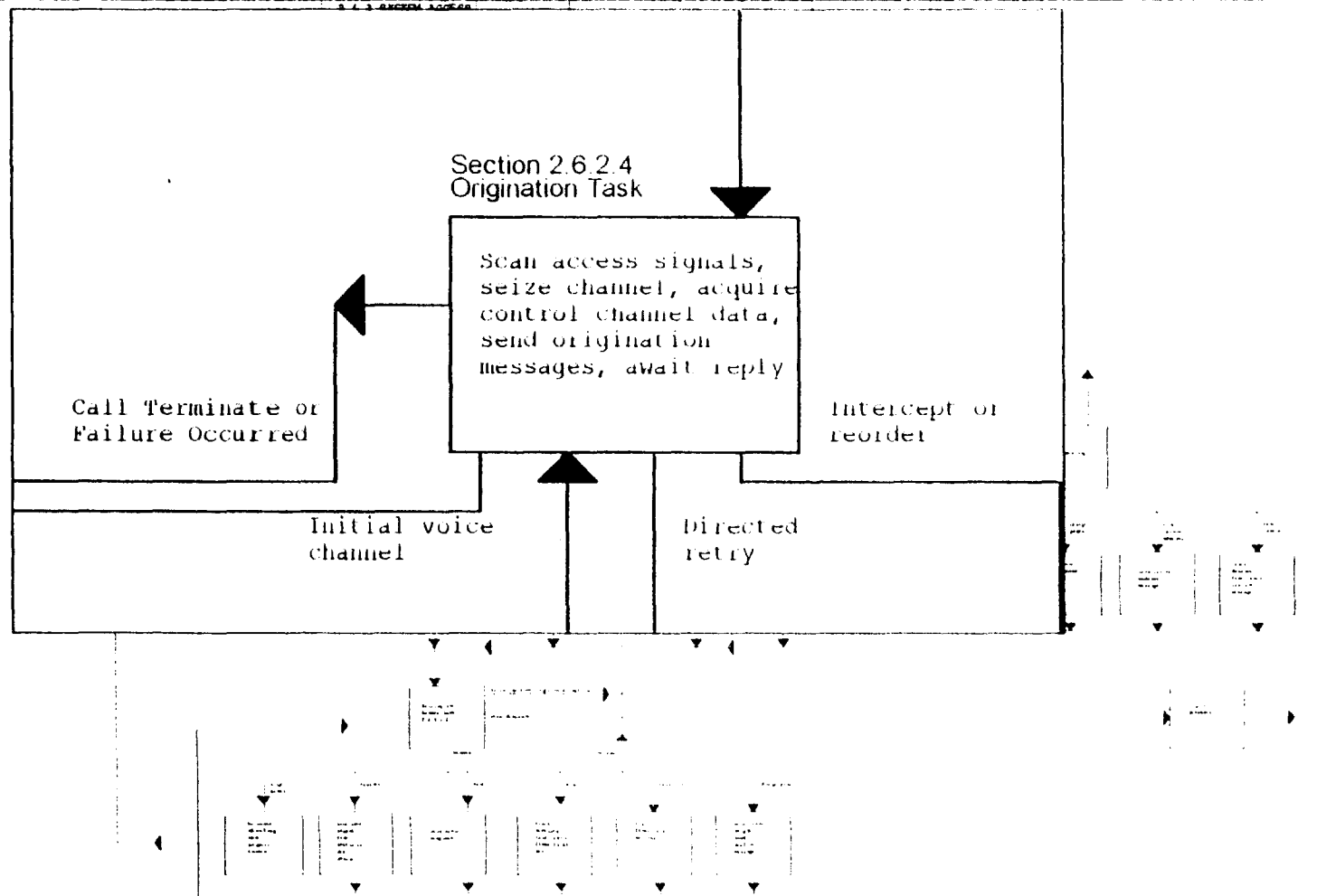
MOV A,NLIST_D ; Load A register with Number of Control Channels
DEC A          ; Decrement A
ST A,NLIST_D   ; Store A into Number of Control Channels
JZ SCNC7       ; If A = 0 then Jump to SCN7 (Done with loop)
CALL CNTUPCH   ; COUNT UP CHANNEL.

```

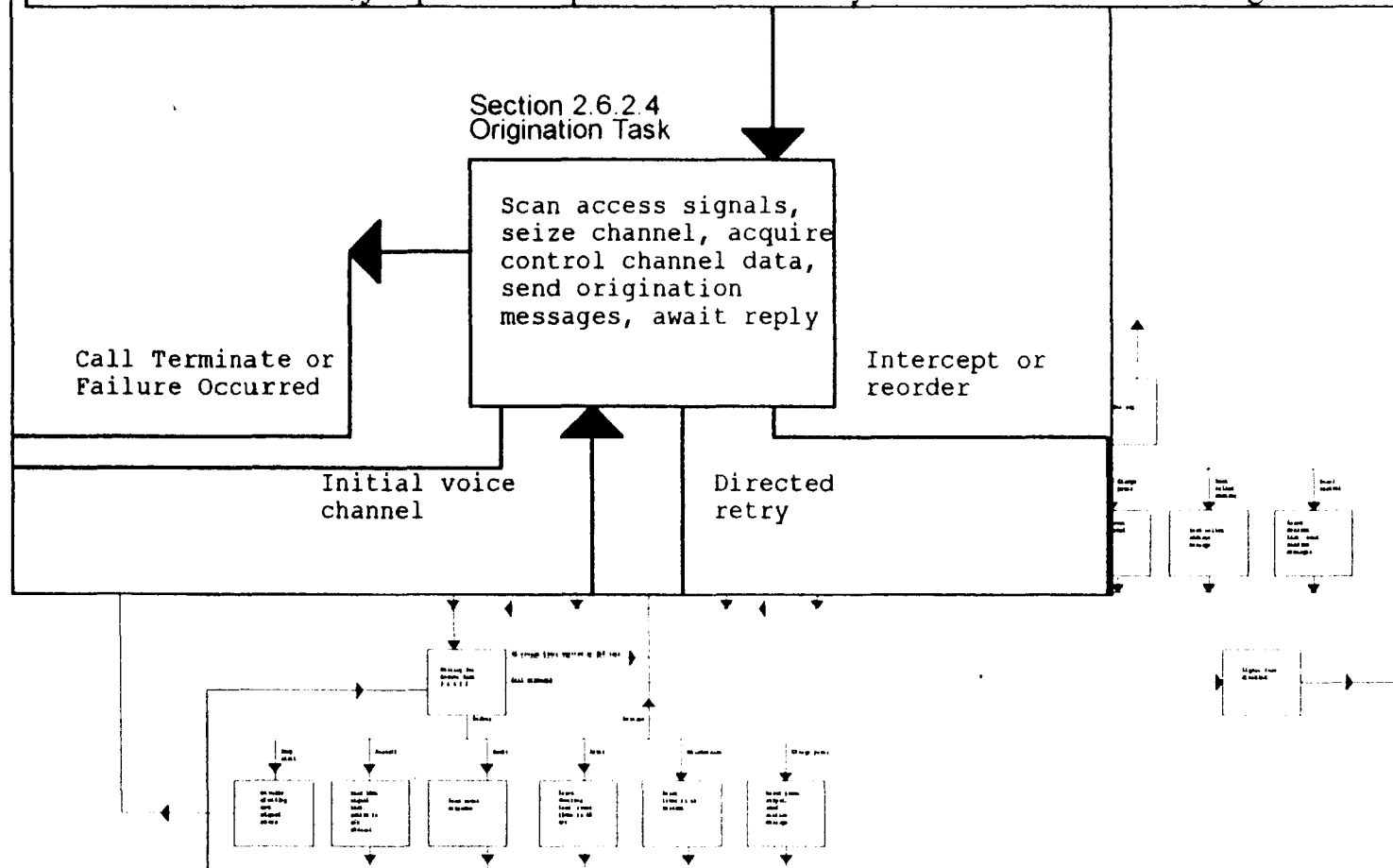
```

CALL FREQS ; Tune to new channel
JMP SCNC1 ; Go back to the top

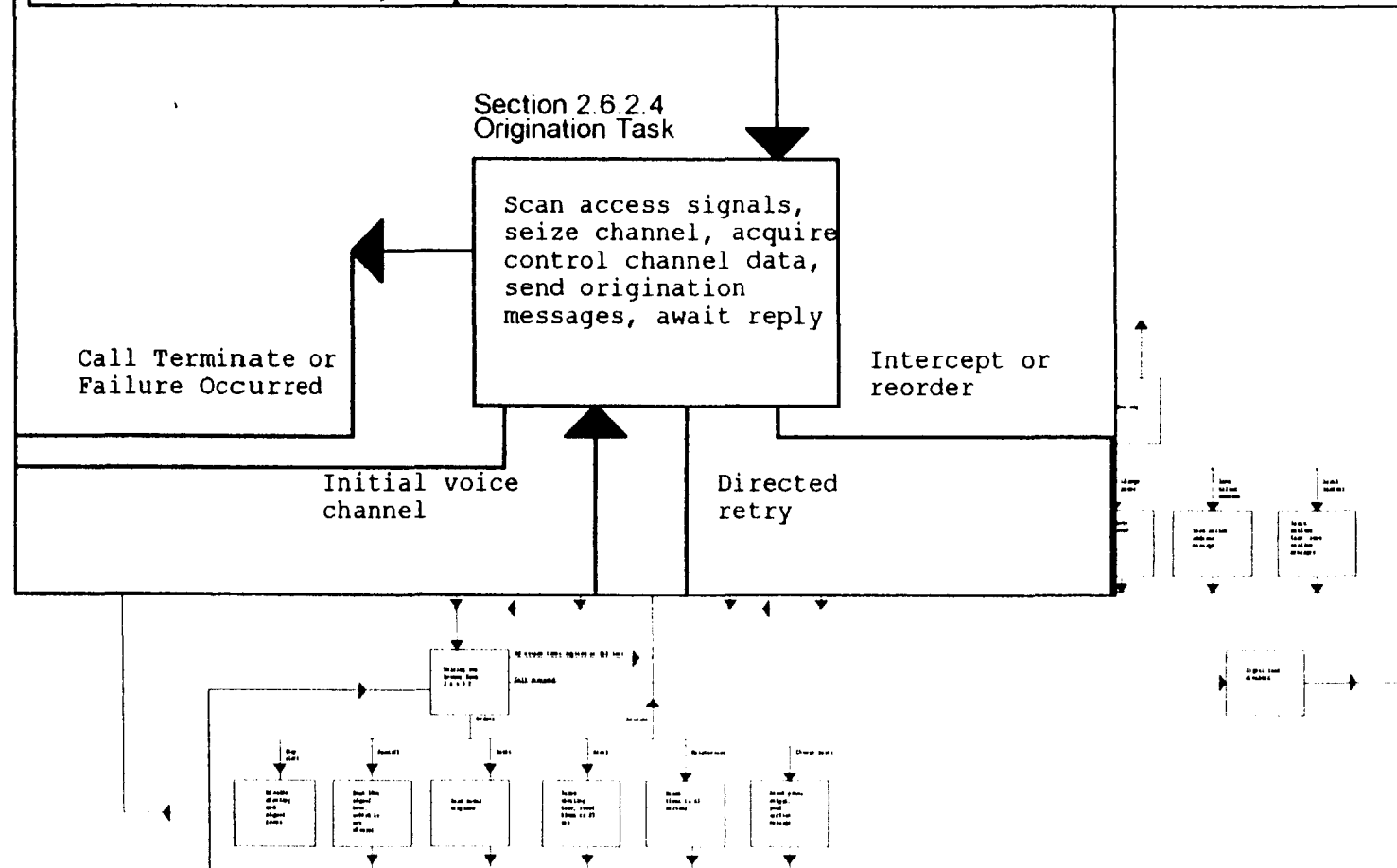
```

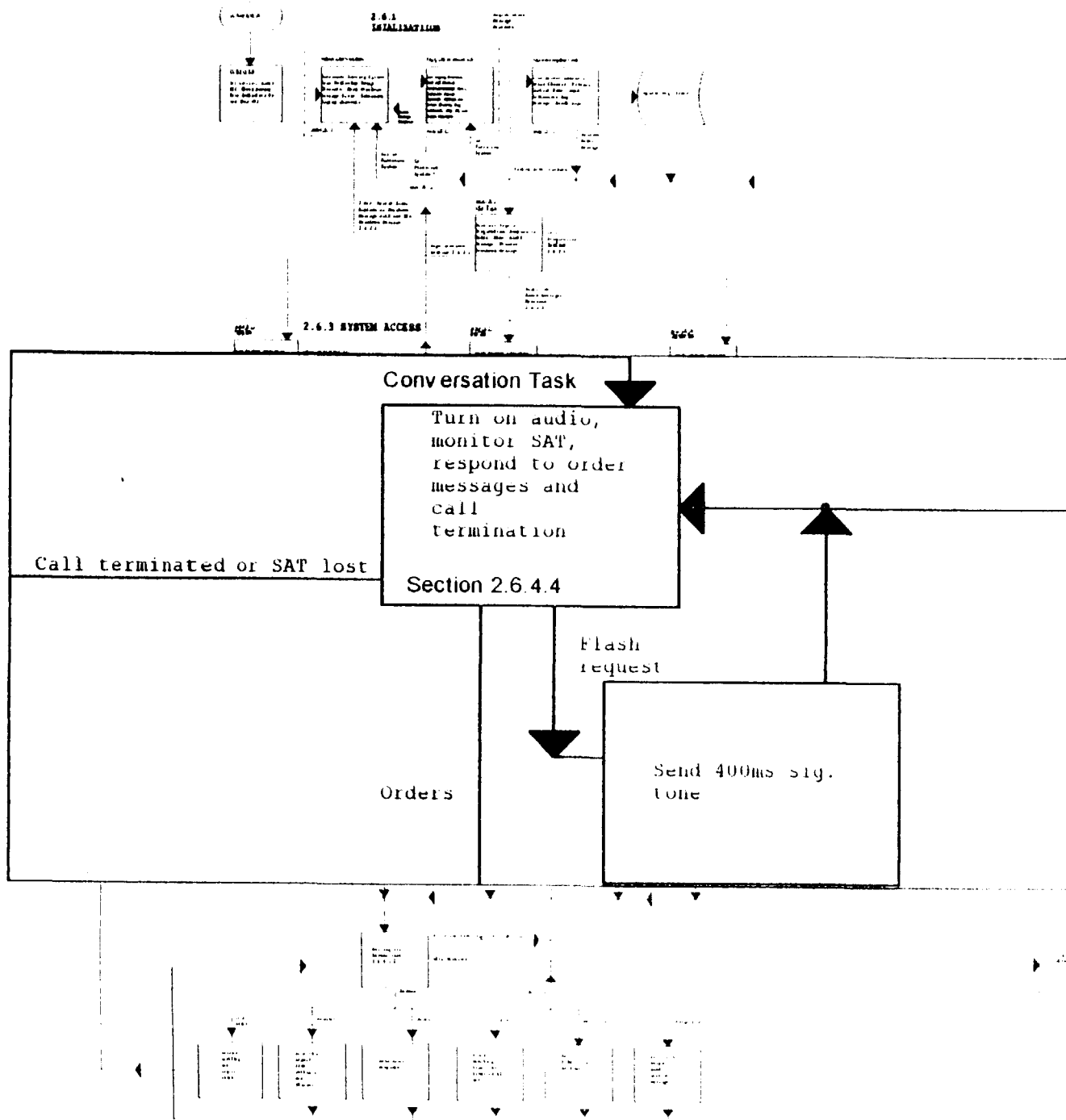


```
JBR      EMGNCY_B,NON911      ; IF NOT 911 CALL – JUMP
;This level will be compared to –80 dBm or greater if this is the first pass
JBR      FIRSTPASS, NOCOMPARE; IF NOT FIRSTPASS CALL – JUMP
CLR      FIRSTPASS ; This will indicate if this is the second time through this code
MOV A,RSSII_D
SUBC A, #133 ; Subtract decimal 133 which corresponds to –80 dBm
JC SCNDCC ; jump back to top of SCNDCC if carry bit is set. This indicates a negative number.
```



**JMP TUNEC ; Jump to tune channel routine**





# Cost to Implement

	Strongest/Adequate Signal with Adjustable Threshold Level	Strongest/Adequate Signal	Strongest Signal
Lines of Code	160	25	20
Bytes of Code	480	75	60
Code Analysis	\$120,000.00	\$60,000.00	\$60,000.00
Code Mod.	\$240,000.00	\$37,500.00	\$30,000.00
Code Testing	\$360,000.00	\$240,000.00	\$240,000.00
Manufacturing	\$224,000.00	\$224,000.00	\$224,000.00
Documentation	\$250,000.00	\$0.00	\$0.00
Total	\$1,194,000.00	\$561,500.00	\$554,000.00
Cost/Handset	\$0.12	\$0.06	\$0.06

### Original Code for section 2.6.3.2

#### From Memory Initialization Task

```
NDED EQU 21 ;
IDCCA EQU 333 ;
IDCCB EQU 334 ;
```

#### From Scan Dedicated Control Channel Task.

```
; SCAN DEDICATED CONTROL CHANNEL;
SCNDCC:
MOVW BA,#IDCCA ; Set A and B register to First Dedicated Control Channel of A system (333)
JBS SSS_B,DCCHS1 ; Jump to DCCHS1 if SSS_B is set to true (This is the A system)
MOVW BA,#IDCCB ; Set A and B register to First Dedicated Control Channel of B system (334)

DCCHS1:
ST B,CHAN_D+1 ; Store the Channel number from above into the Channel Variable
ST A,CHAN_D
MOV R6,#NDED ; Set R6 to 21 (NDED contains 21)
CAL SCNCC ; Call the Scan Control Channel Routine
```

This routine is called with the value of R6 = NDED

```
; SCAN CONTROL CHANNEL;
SCNCC:
CLRW BA ; Clear the B and A registers
ST A,RSSI1_D ; RSSI1_D <-- 0 (This is the strongest Channel level)
ST A,RSSI2_D ; RSSI2_D <-- 0 (This is the second strongest Channel level)
MOVW CHWK1_D,BA ; CHWK1_D <-- 0 (This is the strongest Channel number)
MOVW CHWK2_D,BA ; CHWK2_D <-- 0 (This is the second strongest Channel number)
MOV NLIST_D,R6 ; Move the number of Control Channels to scan into NLIST_D (21)
```

Code to tune to the CHAN\_D and read the RSSI value is here

This will include incrementing the channel through the required number of control channels.

The NLIST\_D variable will decrement. If it is not zero the loop will continue.

RSSI1\_D will contain the strongest level read across the 21 control channels.

CHWK1\_D will contain the channel number with the strongest RSSI level.

RSSI2\_D will contain the second strongest level read across the 21 control channels.

CHWK2\_D will contain the channel number with the second strongest RSSI level.

CHWK1\_D is moved to CHAN\_D and the channel is tuned.

```
MOV CHAN_D,CHWK1_D
MOV CHAN_D+1,CHWK1_D+1
MOV RSSI_D,RSSI1_D
JMP TUNEC ; Jump to tune channel routine
```



### Strongest Signal Code for section 2.6.3.2

From Scan Dedicated Control Channel Task.

```
;          SCAN DEDICATED CONTROL CHANNEL;
SCNDCC:
JBR      EMGNCY_B, NON911          ; If NOT 911 CALL - JUMP

MOVW     BA, #354 ; Set A and B register to Last Dedicated Control Channel of B system (354)
JBS      SSS_B, DCCHS1 ; Jump to DCCHS1 if SSS_B is set to true (This is the A system)
MOVW     BA, #313 ; Set A and B register to Last Dedicated Control Channel of A system (313)
MOV      R6, #42 ; Set R6 to 42

NON911
MOVW     BA, #IDCCA ; Set A and B register to First Dedicated Control Channel of A system (333)
JBS      SSS_B, DCCHS1 ; Jump to DCCHS1 if SSS_B is set to true (This is the A system)
MOVW     BA, #IDCCB ; Set A and B register to First Dedicated Control Channel of B system (334)
MOV      R6, #NDED ; Set R6 to 21 (NDED contains 21)

DCCHS1:
ST       B, CHAN_D+1 ; Store the Channel number from above into the Channel Variable
ST       A, CHAN_D
CAL      SCNCC ; Call the Scan Control Channel Routine

;          SCAN CONTROL CHANNEL;
SCNCC:
CLRW     BA ; Clear the B and A registers
ST       A, RSSI1_D ; RSSI1_D <-- 0 (This is the strongest Channel level)
ST       A, RSSI2_D ; RSSI2_D <-- 0 (This is the second strongest Channel level)
MOVW     CHWK1_D, BA ; CHWK1_D <-- 0 (This is the strongest Channel number)
MOVW     CHWK2_D, BA ; CHWK2_D <-- 0 (This is the second strongest Channel number)
MOV      NLIST_D, R6 ; Move the number of Control Channels to scan into NLIST_D (21 or 42)

Code to tune to the CHAN_D and read the RSSI value is here
This will include incrementing the channel through the required number of control channels.
The NLIST_D variable will decrement. If it is not zero the loop will continue.

RSSI1_D will contain the strongest level read across the 21 or 42 control channels.
CHWK1_D will contain the channel number with the strongest RSSI level.
RSSI2_D will contain the second strongest level read across the 21 or 42 control channels.
CHWK2_D will contain the channel number with the second strongest RSSI level.

CHWK1_D is moved to CHAN_D and the channel is tuned.
MOV CHAN_D, CHWK1_D
MOV CHAN_D+1, CHWK1_D+1
MOV RSSI_D, RSSI1_D
JMP TUNEC ; Jump to tune channel routine
```

### Strongest/Adequate Signal Code for section 2.6.3.2

From Scan Dedicated Control Channel Task.

```
;          SCAN DEDICATED CONTROL CHANNEL;
SETB     FIRSTPASS ; This will indicate if this is the first time through this code
SCNDCC:

JBR      FIRSTPASS, SCNDCC2 ; IF NOT FIRSTPASS CALL = JUMP
MOVW     BA, #IDCCA ; Set A and B register to First Dedicated Control Channel of A system (333)
JBS      SSS_B, DCCHS1 ; Jump to DCCHS1 if SSS_B is set to true (This is the A system)
MOVW     BA, #IDCCB ; Set A and B register to First Dedicated Control Channel of B system (334)
JMP      DCCHS1

SCNDCC2:
MOVW     BA, #354 ; Set A and B register to Last Dedicated Control Channel of B system (354)
JBS      SSS_B, DCCHS1 ; Jump to DCCHS1 if SSS_B is set to true (This is the A system)
MOVW     BA, #313 ; Set A and B register to Last Dedicated Control Channel of A system (313)

DCCHS1:
ST        B, CHAN_D+1 ; Store the Channel number from above into the Channel Variable
ST        A, CHAN_D
MOV       R6, #NDED ; Set R6 to 21 (NDED contains 21)
CAL       SCNCC ; Call the Scan Control Channel Routine

;          SCAN CONTROL CHANNEL;
SCNCC:
; This will force the code to clear the scan list on the first pass only
JBR      FIRSTPASS, SECONDPASS ; IF NOT FIRSTPASS CALL = JUMP
CLRW     BA ; Clear the B and A registers
ST        A, RSSI1_D ; RSSI1_D <= 0 (This is the strongest Channel level)
ST        A, RSSI2_D ; RSSI2_D <= 0 (This is the second strongest Channel level)
MOVW     CHWK1_D, BA ; CHWK1_D <= 0 (This is the strongest Channel number)
MOVW     CHWK2_D, BA ; CHWK2_D <= 0 (This is the second strongest Channel number)
MOV       NLIST_D, R6 ; Move the number of Control Channels to scan into NLIST_D (21 or 42)

SECONDPASS:

Code to tune to the CHAN_D and read the RSSI value is here
This will include incrementing the channel through the required number of control channels.
The NLIST_D variable will decrement. If it is not zero the loop will continue.

RSSI1_D will contain the strongest level read across the 21 control channels.
CHWK1_D will contain the channel number with the strongest RSSI level.
RSSI2_D will contain the second strongest level read across the 21 control channels.
CHWK2_D will contain the channel number with the second strongest RSSI level.

JBR      EMGNCY_B, NON911 ; IF NOT 911 CALL = JUMP
; This level will be compared to -80 dBm or greater if this is the first pass
JBR      FIRSTPASS, NOCOMPARE ; IF NOT FIRSTPASS CALL = JUMP
CLR      FIRSTPASS ; This will indicate if this is the second time through this code
MOV       A, RSSI1_D
SUBC     A, #133 ; Subtract decimal 133 which corresponds to -80 dBm
JC       SCNDCC ; jump back to top of SCNDCC if carry bit is set. This indicates a negative number.
; The Value is greater than or equal to -80dBm
NOCOMPARE:
NON911:
; CHWK1_D is moved to CHAN_D and the channel is tuned.
MOV       CHAN_D, CHWK1_D
MOV       CHAN_D+1, CHWK1_D+1
MOV       RSSI_D, RSSI1_D
JMP       TUNEC ; Jump to tune channel routine
```